

TOSHIBA

FILE NO. 050-200414

SERVICE MANUAL

LCD TELEVISION

14DL74 / 20DL74

Table of Contents

WARNINGS	3
SERVICE SAFETY PRECAUTIONS	4
Examples of Marks.....	4
HANDLING THE LCD MODULE	5
Safety Precautions.....	5
Precautions for Handling the LCD Module.....	5
LOCATION OF CONTROLS	6
TV Front	6
TV Rear.....	6
Remote Control	7
LAYOUT OF MAJOR BOARDS	8
MECHANICAL DISASSEMBLY	9
PACKING DISASSEMBLY	12
WIRING CONNECTION DIAGRAM	13
CIRCUIT BOARD DIAGRAMS	14
MAINBOARD	14
KEY/CONTROL BOARD.....	18
LIGHT-RECEIVING BOARD.....	18
EARPHONE BOARD	19
SCHEMATIC DIAGRAMS	20
BLOCK DIAGRAM	21
STANDARD MCU	22
SCALER.....	23
SCALER MEMORY.....	24
VIDEO DECODER	25
V-CHIP & CC	26
AUDIO PROCESSOR.....	27
POWER AMPLIFIER.....	28
AV SWITCH	29
NTSC TUNER.....	30
USA MTS	31
PANEL CONNECTOR	32
POWER SYSTEMS	33
I/O CONNECTOR	34
USA 480P	35
IR BOARD.....	36
EARPHONE BOARD	37
KEYPAD BOARD.....	38
CHASSIS AND CABINET REPLACEMENT PARTS LIST	39
14DL74	39
20DL74	40
SPECIFICATIONS	41
14/20DL74 LCD TV Specifications.....	41



WARNINGS

Take care to heed the following warnings:

 KEEP CHILDREN AWAY	Always advise users to keep children away. There is danger of injury to children from tools, disassembled products, etc.
 UNPLUG	Always disconnect the power plug before starting work whenever power is not required. Failure to disconnect the power plug before starting work can result in electrical shock.
 SHOCK HAZARD	Depending on the model, use an insulation transformer or wear gloves when servicing with the power on, and disconnect the power plug to avoid electrical shock when replacing parts. In some cases, alternating current is also impressed in the chassis, so electrical shock is possible if the chassis is contacted with the power on.
 USE SPECIFIED PARTS	Always use the replacement parts specified for the particular model when making repairs. The parts used in products have the necessary safety characteristics such as inflammability, voltage resistance, etc.; therefore, use only replacement parts that have these same characteristics. Use only the specified parts when the  mark is included in a circuit diagram or parts list.
 CAUTION FOR WIRING	Parts mounting and routing of the wiring should be the same as that used originally. For safety purposes, insulating materials such as tubing or tape is sometimes used and printed circuit boards are sometimes mounted floating. Also make sure that wiring is routed and clamped to avoid parts that generate heat and which use high voltage. Always follow the original scheme.
 CAUTION FOR ASSEMBLY/WIRING	After a repair has been completed, reassemble all disassembled parts, and route and reconnect the wiring, in accordance with the original scheme. Do not allow internal wiring to be pinched by cabinets, panels, etc. Any error in reassembly or wiring can result in electrical leakage, flame, etc., and may be hazardous.
 CHECK INSULATION RESISTANCE	After completing the work, disconnect the power plug from the outlet, remove the antenna, turn on the power switch. Then, use a 500V insulation resistance meter to check the insulation resistance of the antenna terminal, other metallic parts and between the prongs of the power plug to make sure that the insulation resistance is $1M\ \Omega$ or more. The set will require inspection and repair if the insulation resistance is below this value.
 PROHIBIT REMODELLING	Never remodel the product in any way. Remodelling can result in improper operation, malfunction, or electrical leakage and flame, which may be hazardous



SERVICE SAFETY PRECAUTIONS

The caution items shown here describe major safety issues and should always be observed.
The meanings of the various indications are as follows.

 WARNING	Indicates a hypothetical situation in which service personnel and nearby third parties, or even end users due to a product defect after the service operation is completed, could possibly be in danger of injury or even death in the event of operational error.
 CAUTION	Indicates a hypothetical situation in which service personnel and nearby third parties, or even end users after the service operation is completed, could possibly be in danger of injury, or where there could be physical damage in the event of operational error.

* Physical damage means major damage to a home, furnishings and other possessions.

Examples of Marks

 SHOCK HAZARD	The \triangle indicates caution (including danger and warning). The actual meaning of this caution is indicated inside the \triangle or nearby illustrations or text. The example shown to the left indicates the danger of "electrical shock".
 PROHIBIT DISASSEMBLY	The \odot indicates a forbidden action. The actual meaning of this caution is indicated inside the \odot or nearby illustrations or text. The example shown to the left indicates that disassembly is forbidden.
 UNPLUG	The \circ indicates a forced action (an action that must be performed). The actual meaning of this forced action is indicated by \circ or nearby illustrations or text. The example shown to the left indicates that the power plug must be disconnected.

HANDLING THE LCD MODULE

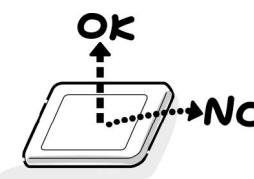
Safety Precautions

In the event that the screen is damaged or the liquid crystal (fluid) leaks, do not breathe in or drink this fluid. Also, never touch this fluid.

Such actions could cause toxicity or skin irritation. If this fluid should enter the mouth, rinse the mouth thoroughly with water. If the fluid should contact the skin or clothing, wipe off with alcohol, etc., and rinse thoroughly with water. If the fluid should enter the eyes, immediately rinse the eyes thoroughly with running water.

Precautions for Handling the LCD Module

The LCD module can easily be damaged during disassembly or reassembly; therefore, always observe the following precautions when handling the module.

1. When attaching the LCD module to the LCD cover, position it appropriately and fasten at the position where the display can be viewed most conveniently.
2. Carefully align the holes at all four corners of the LCD module with the corresponding holes in the LCD cover and fasten with screws. Do not strongly push on the module because any impact can adversely affect the performance. Also use caution when handling the polarized screen because it can easily be damaged.



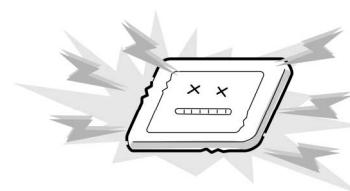
CAUTION

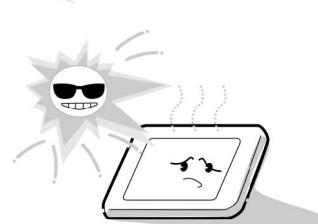
The metal edges of the LCD module are sharp, so use caution to avoid injury.

3. If the panel surface becomes soiled, wipe with cotton or a soft cloth. If this does not remove the soiling, breathe on the surface and then wipe again. If the panel surface is extremely soiled, use a CRT cleaner as a cleaner. Wipe off the panel surface by drop the cleaner on the cloth. Do not drop the cleaner on the panel. Pay attention not to scratch the panel surface.

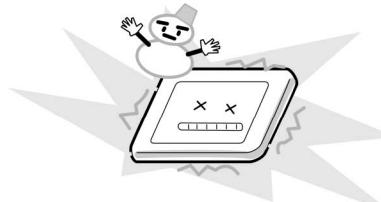
4. Leaving water or other fluids on the panel screen for an extended period of time can result in discoloration or stripes. Immediately remove any type of fluid from the screen.

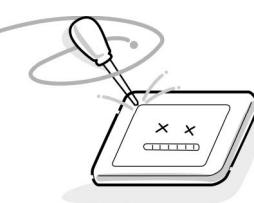
5. Glass is used in the panel, so do not drop or strike with hard objects. Such actions can damage the panel.
6. CMOS-LSI circuitry is used in the LCD module, so avoid damage due to static electricity. When handling the module, use a wrist ground or anchor ground.

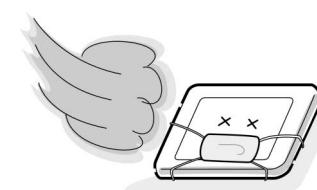


7. Do not expose the LCD module to direct sunlight or strong ultraviolet rays for an extended period of time.

8. Do not store the LCD module below the temperature conditions described in the specifications. Failure to do so could result in freezing of the liquid crystal due to cold air or loss of resilience or other damage.

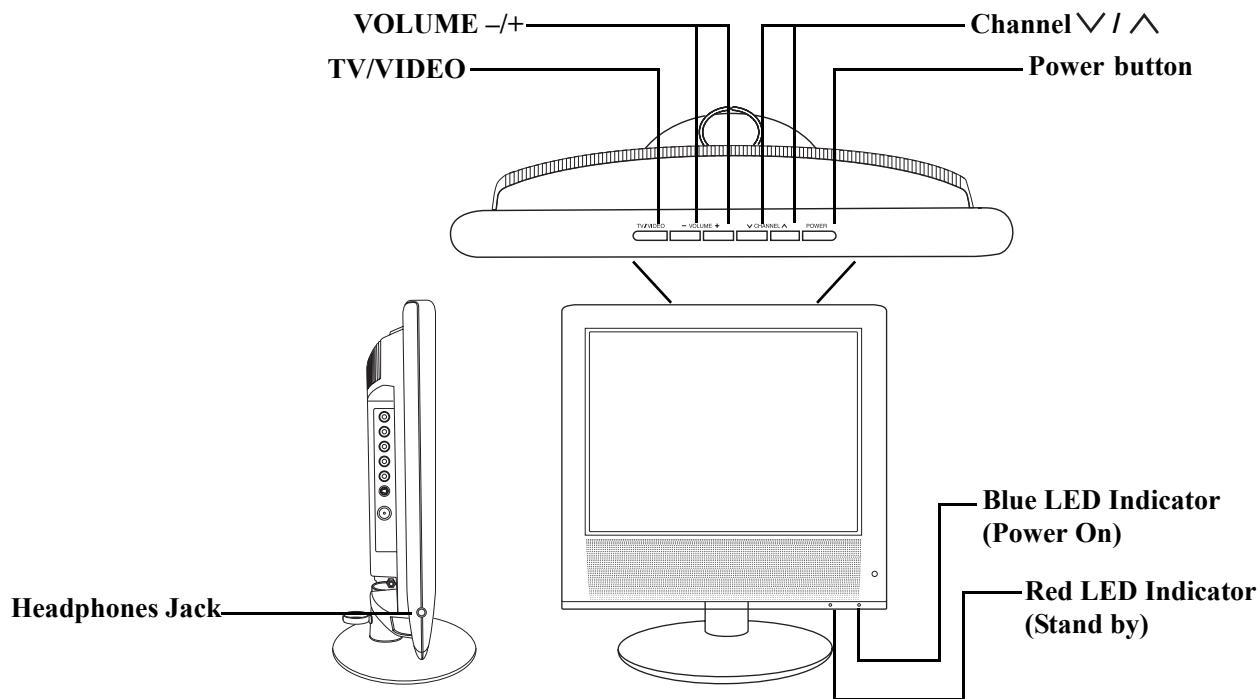
9. Do not disassemble the LCD module. Such actions could result in improper operation.

10. When transporting the LCD module, do not use packing containing epoxy resin (amine) or silicon resin (alcohol or oxim). The gas generated by these materials can cause loss of polarity.

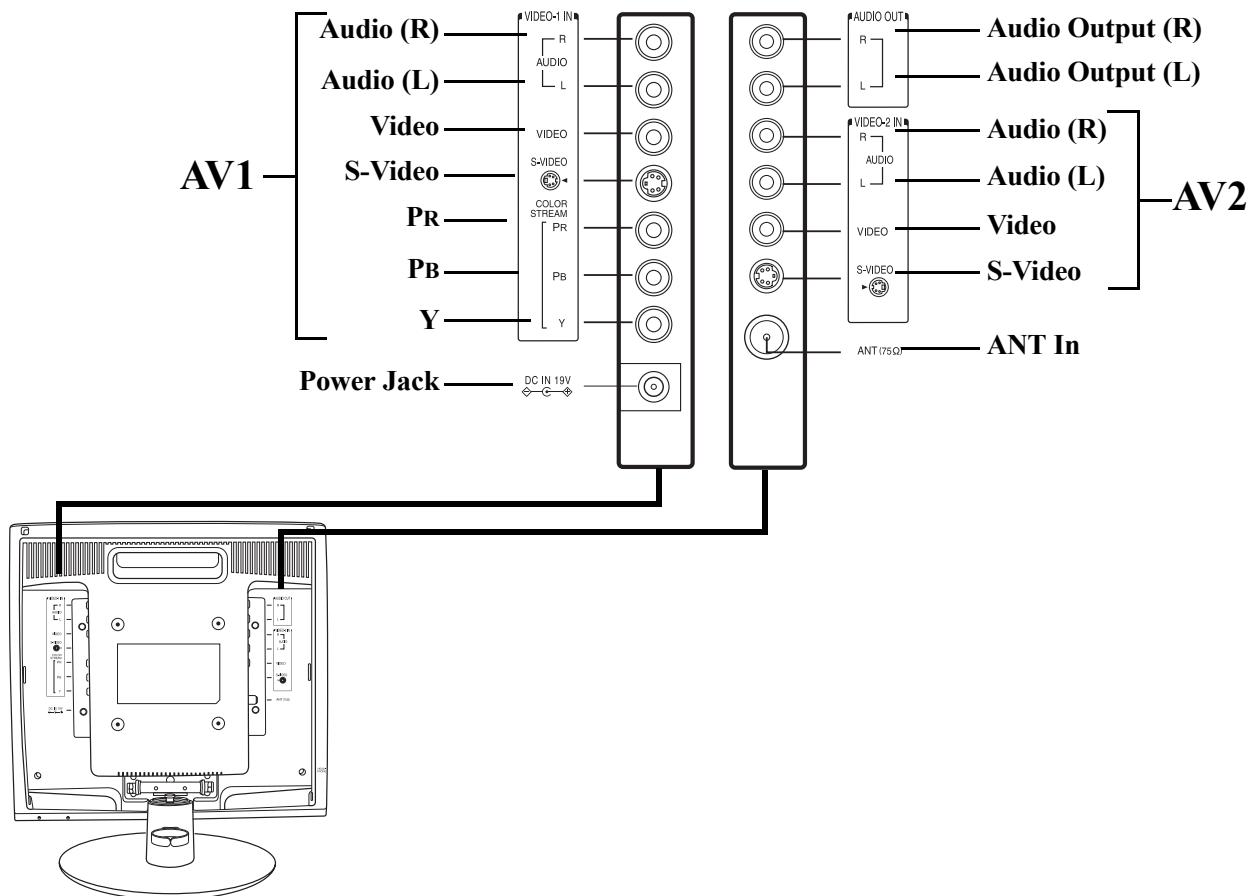


LOCATION OF CONTROLS

TV Front



TV Rear



Remote Control

The illustration shown displays the Remote Control Buttons.

POWER turns the TV on and off.

MUTE turns the sound on and off.

TV selects TV antenna as the input signal.

AV1/AV2 selects the AV input signal from one of these connectors.

Number Buttons allow direct access to channel positions.

VOL +/– Press + to raise the volume; press – to lower it.

CH ▲/▼ Press ▲ to advance one channel number. Press ▼ to go back one channel number.

RECALL Press to go back to the last channel viewed.

MENU allows access to the menu display.

PICTURE Press to toggle between picture modes: USER, DYNAMIC, MILD, and THEATER.

SOUND Press to toggle between sound modes: USER, THEATER, NEWS, and HALL.

BRIGHT Press to toggle the brightness level between NORMAL, BRIGHT, and DARK.

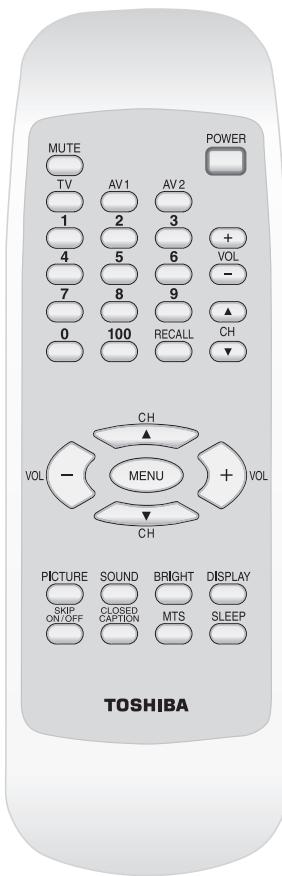
DISPLAY Press to toggle the display information on and off.

SKIP ON/OFF Press to delete a channel; the channel is skipped when channel surfing. Press again to add the channel.

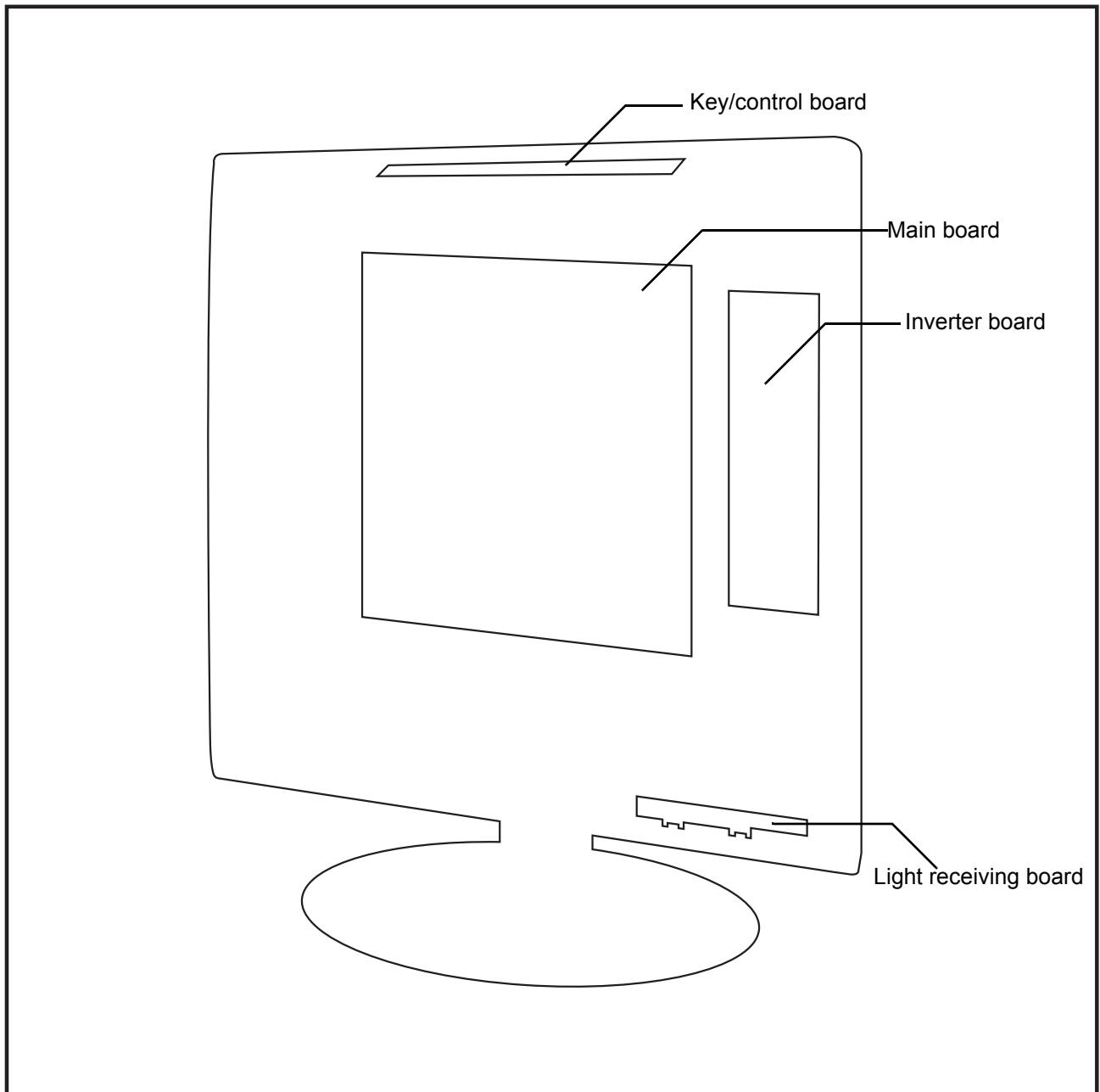
CLOSED CAPTION Press to enable closed captioning.

MTS Press to set the MTS mode.

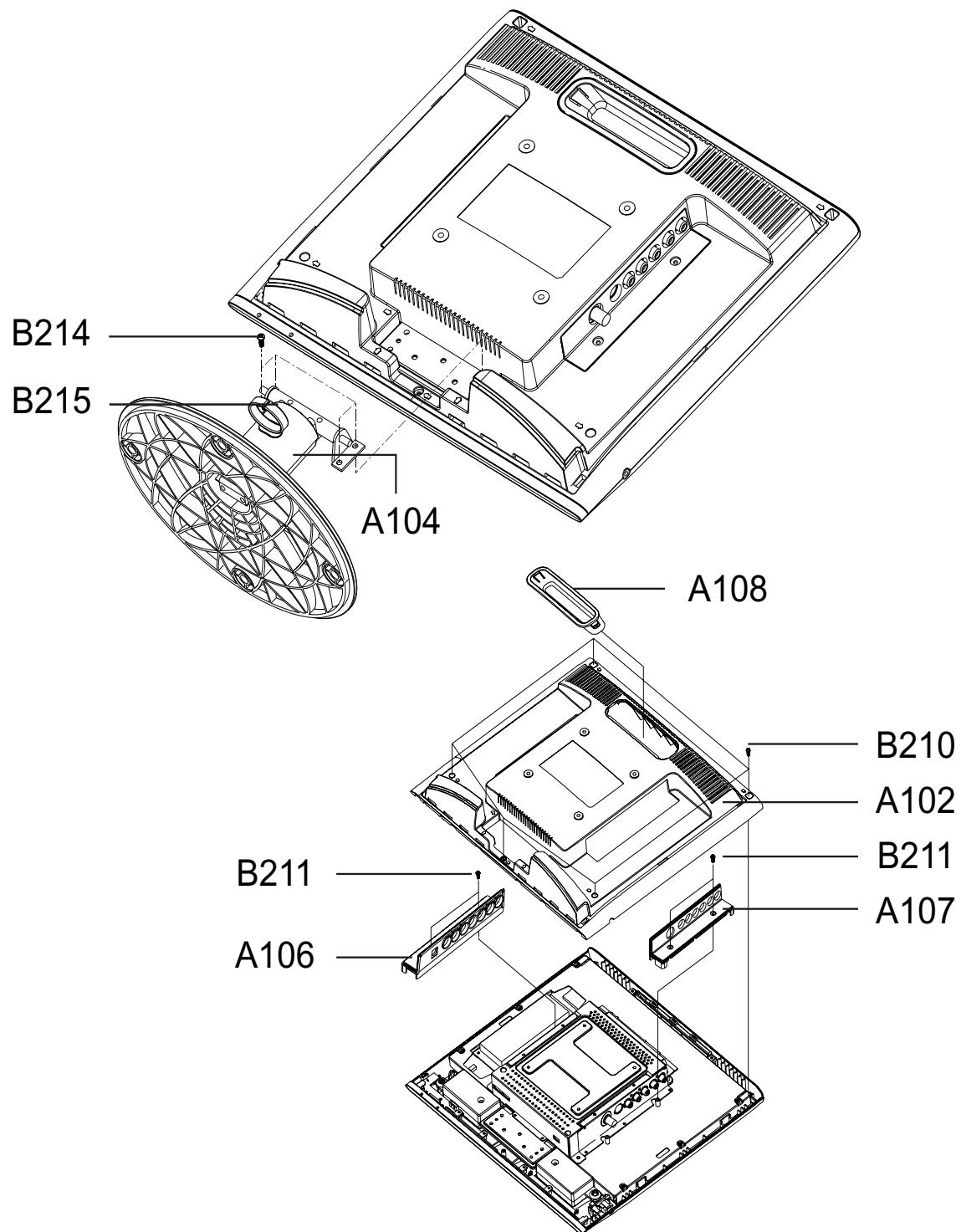
SLEEP Press to set the sleep timer.

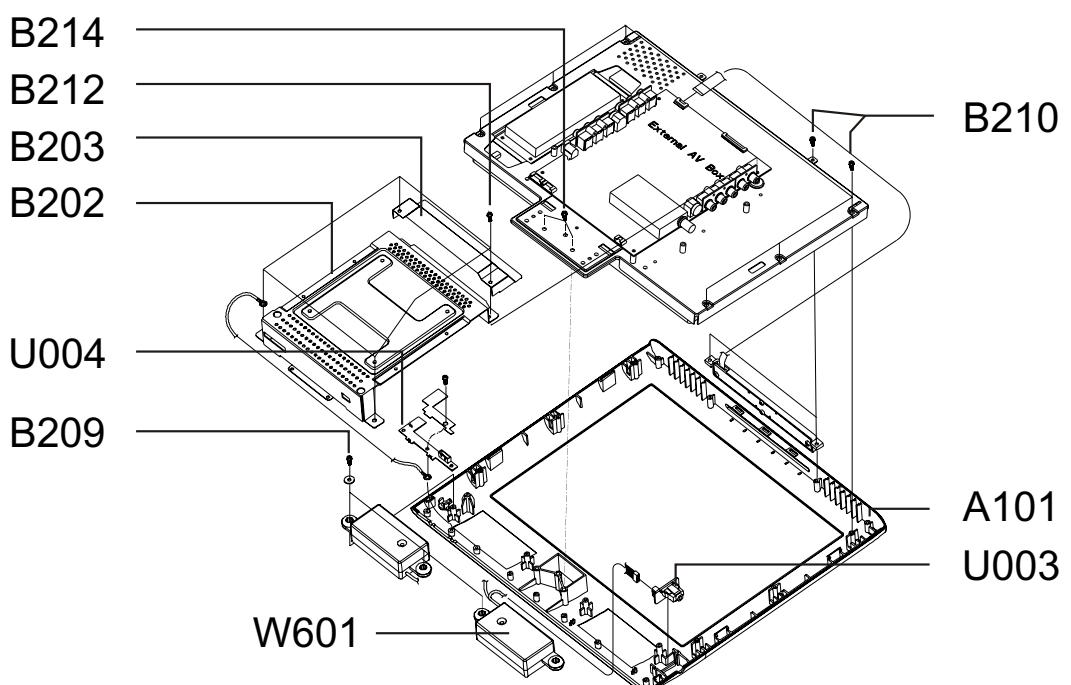
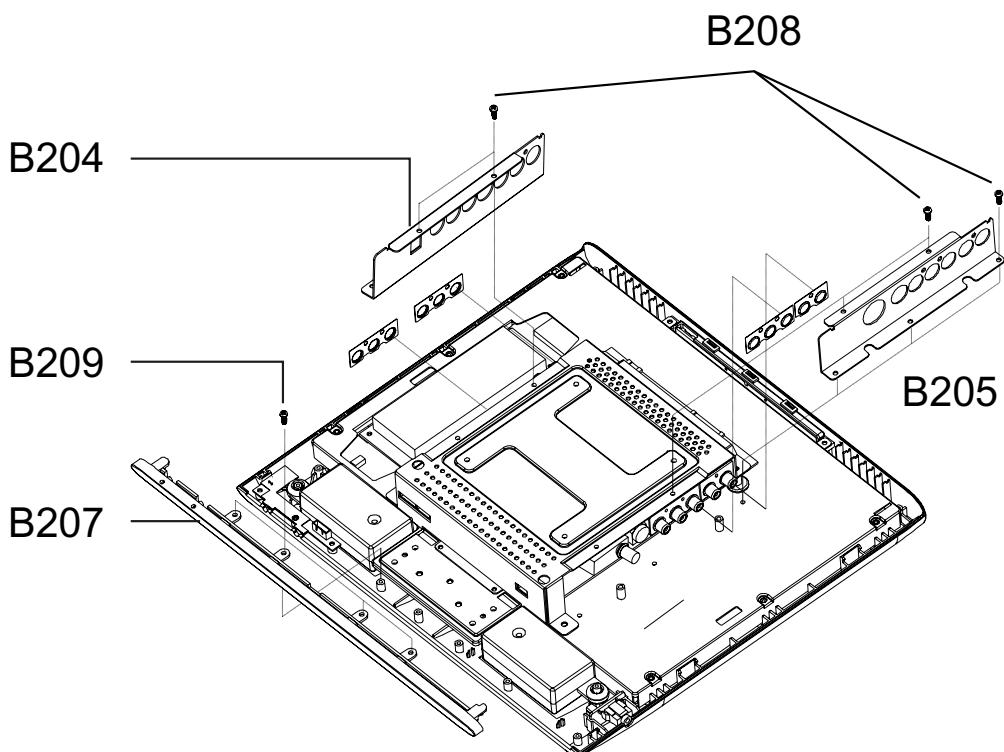


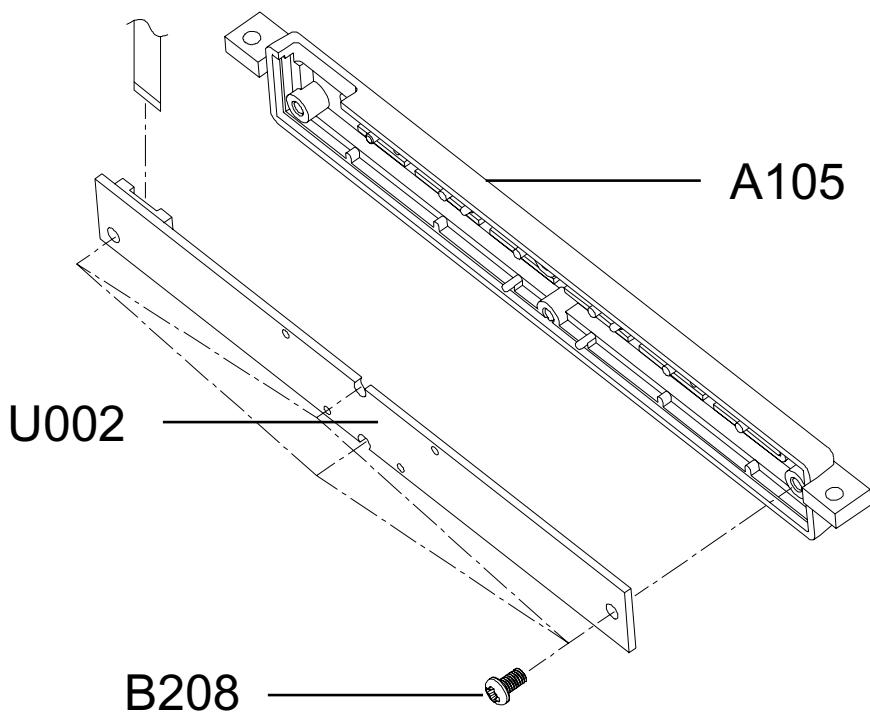
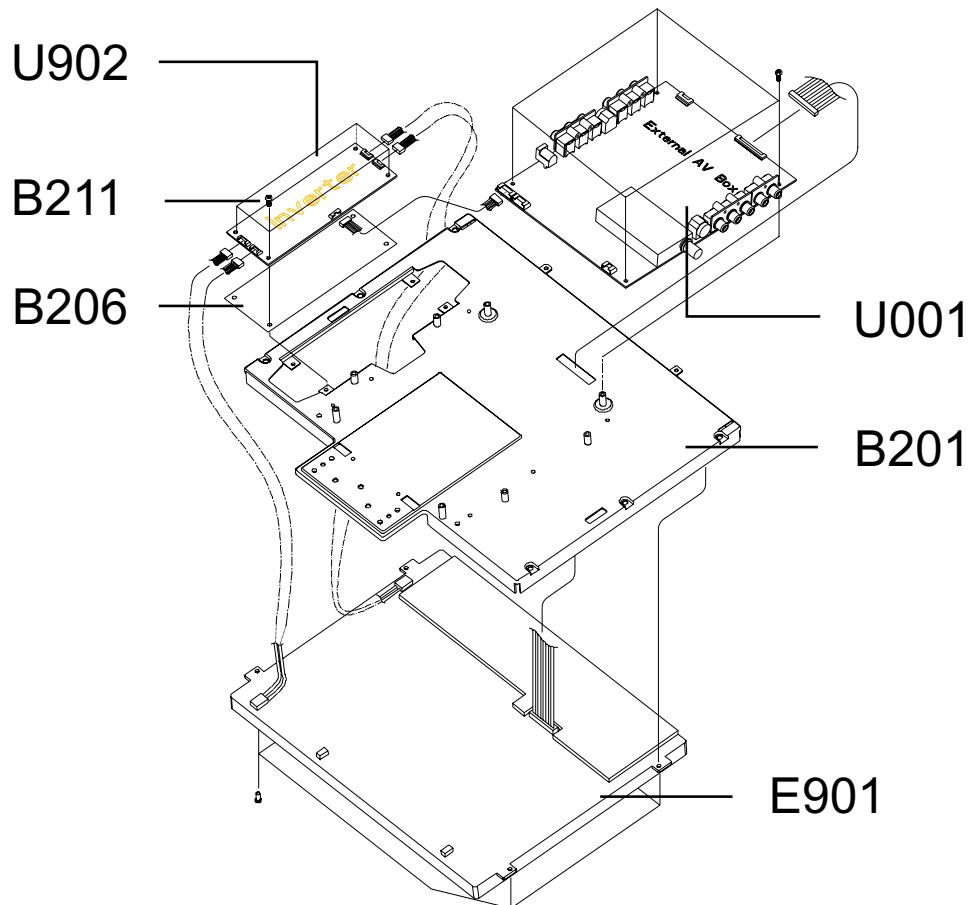
LAYOUT OF MAJOR BOARDS



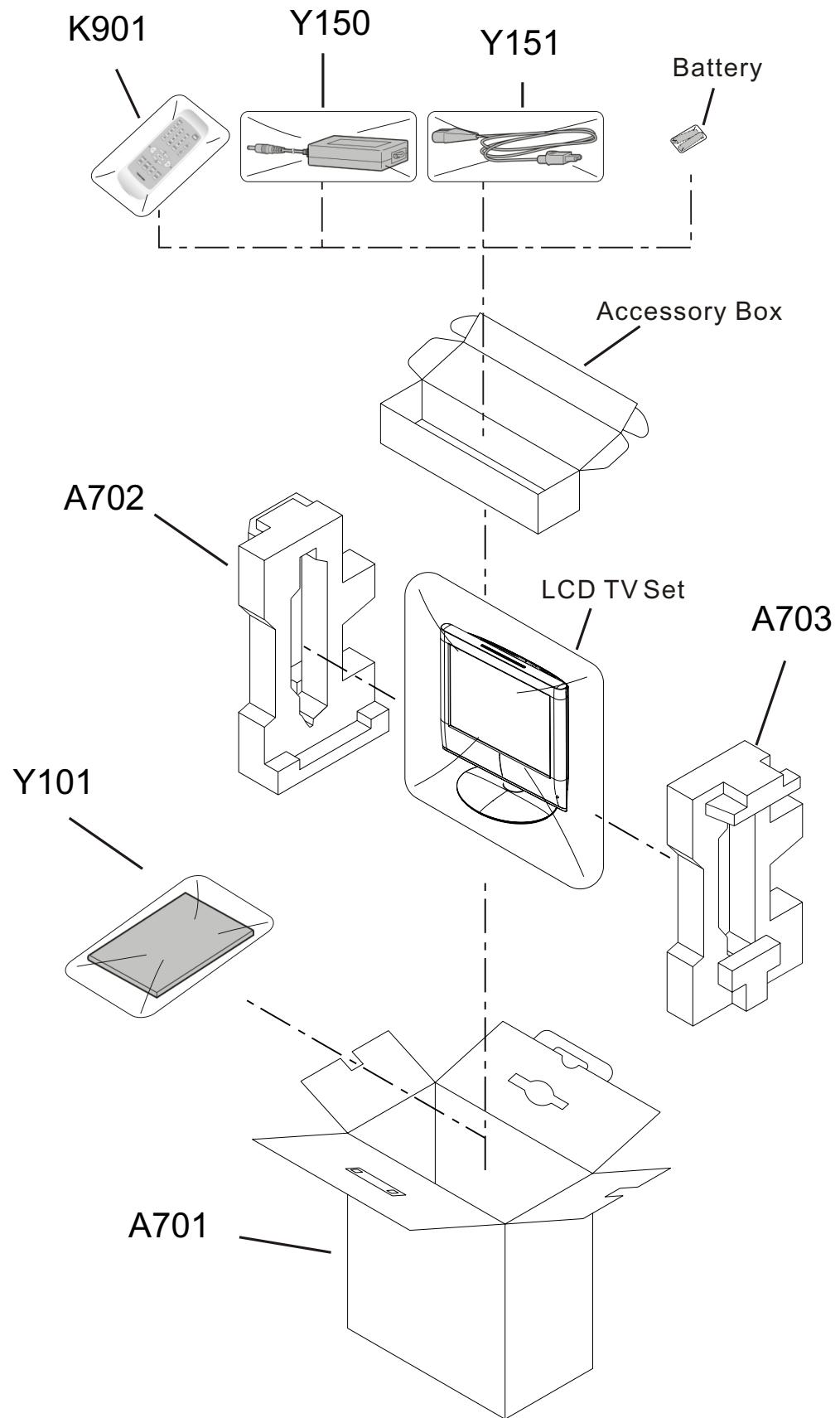
MECHANICAL DISASSEMBLY



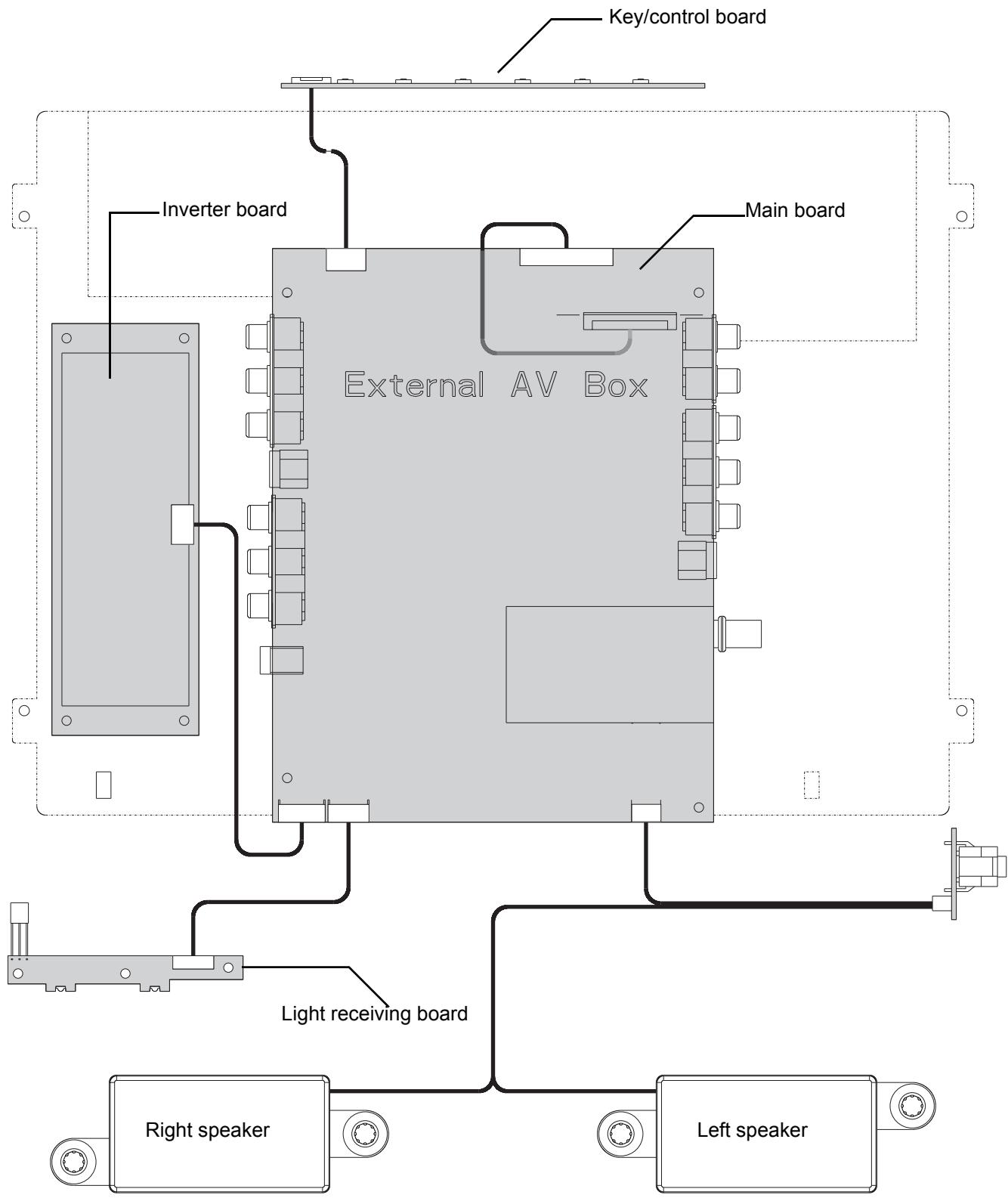




PACKING DISASSEMBLY



WIRING CONNECTION DIAGRAM



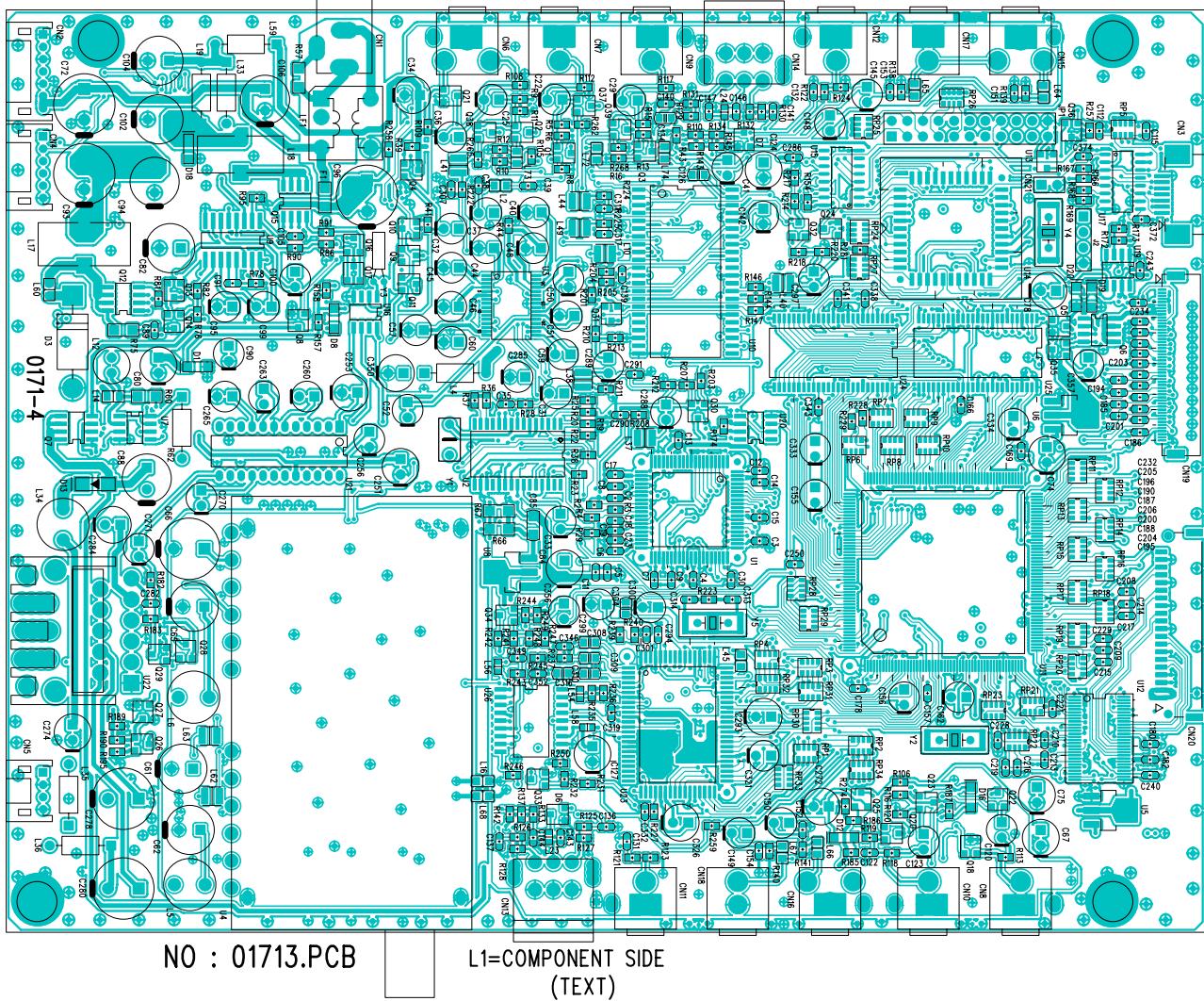
CIRCUIT BOARD DIAGRAMS

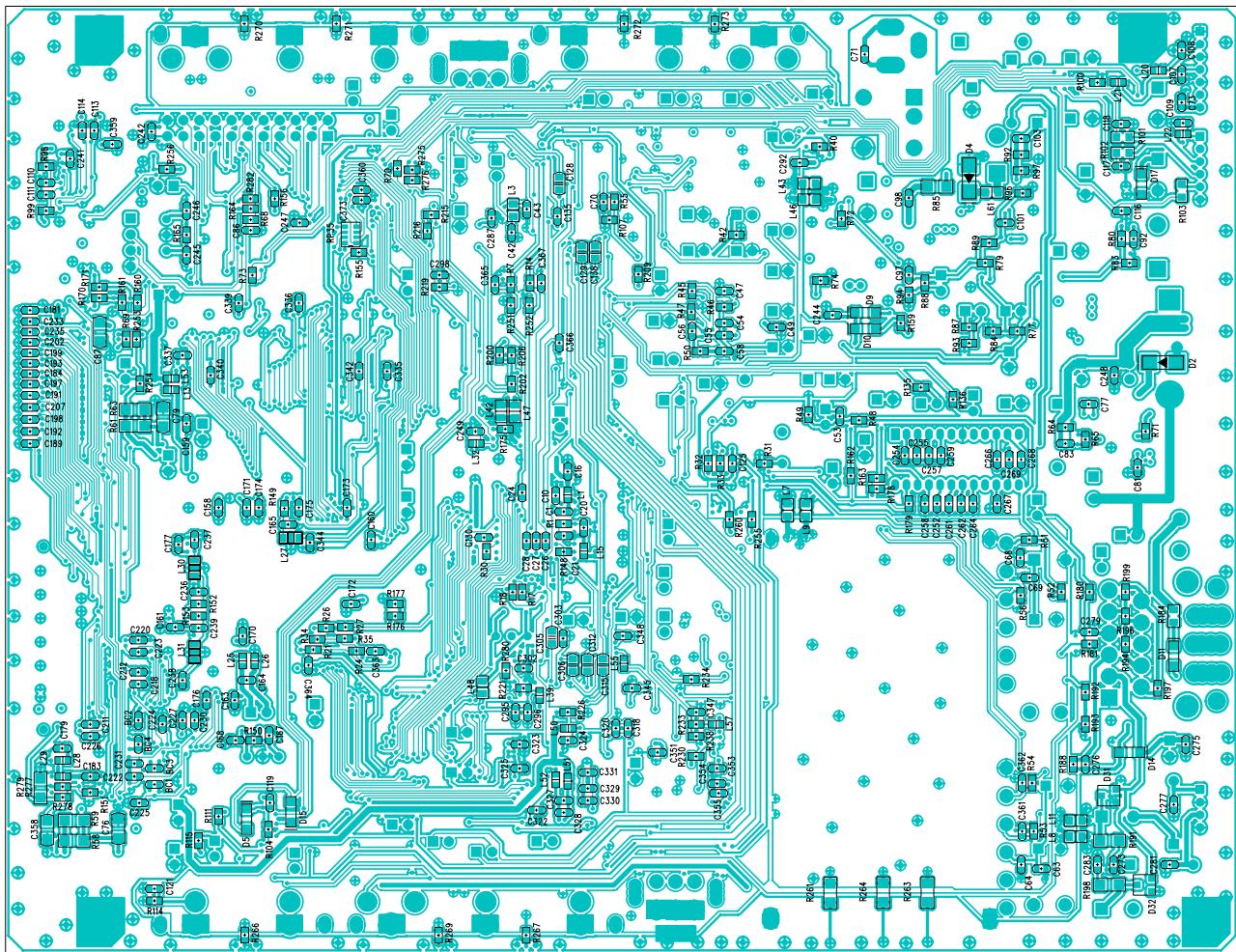
MAINBOARD

0171-4

ALL CLK NEED GND ADD BC1-BC4=VCC3
NET I2C <-> ANALOG (AUDIO)

MOIRE = NPTH



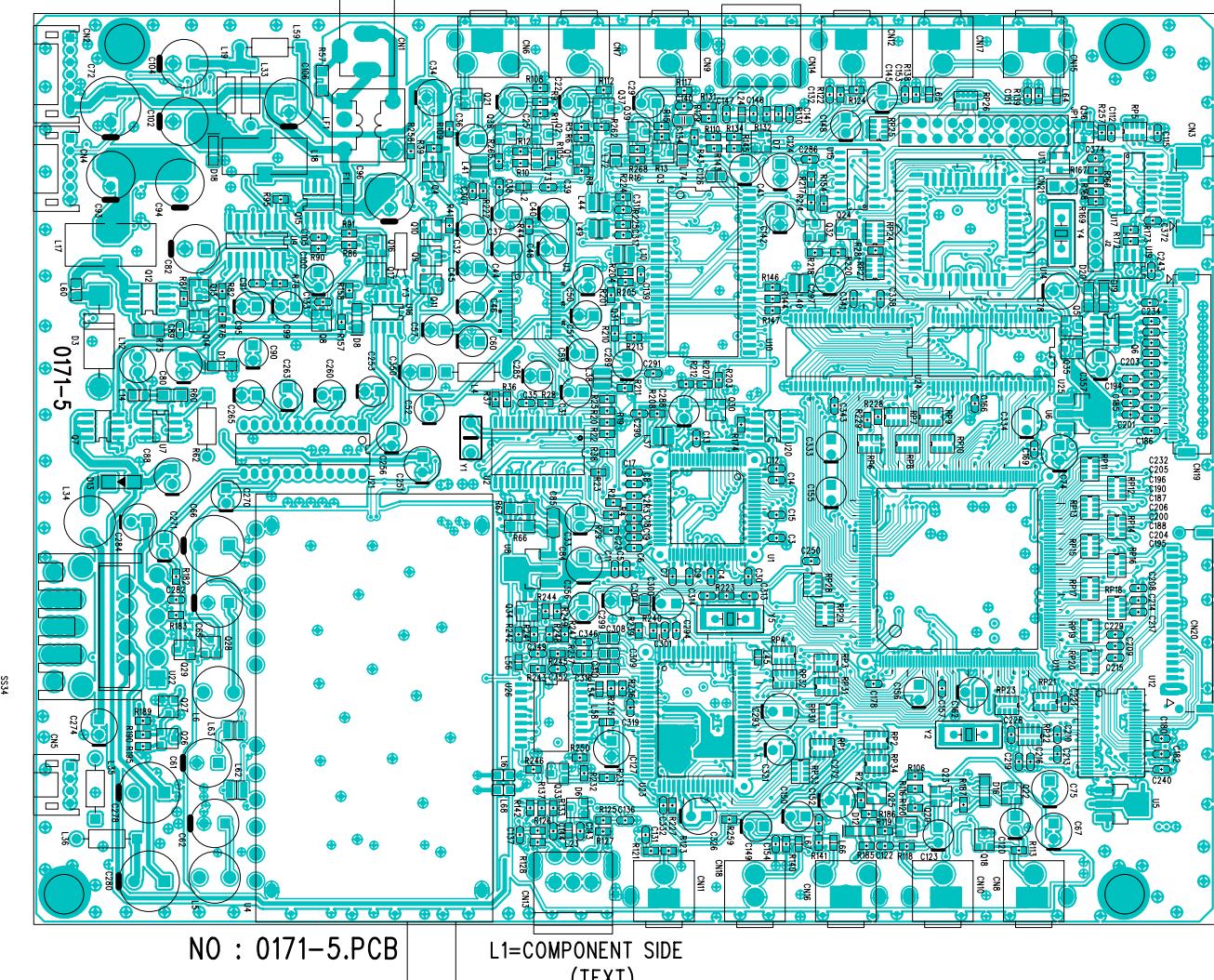


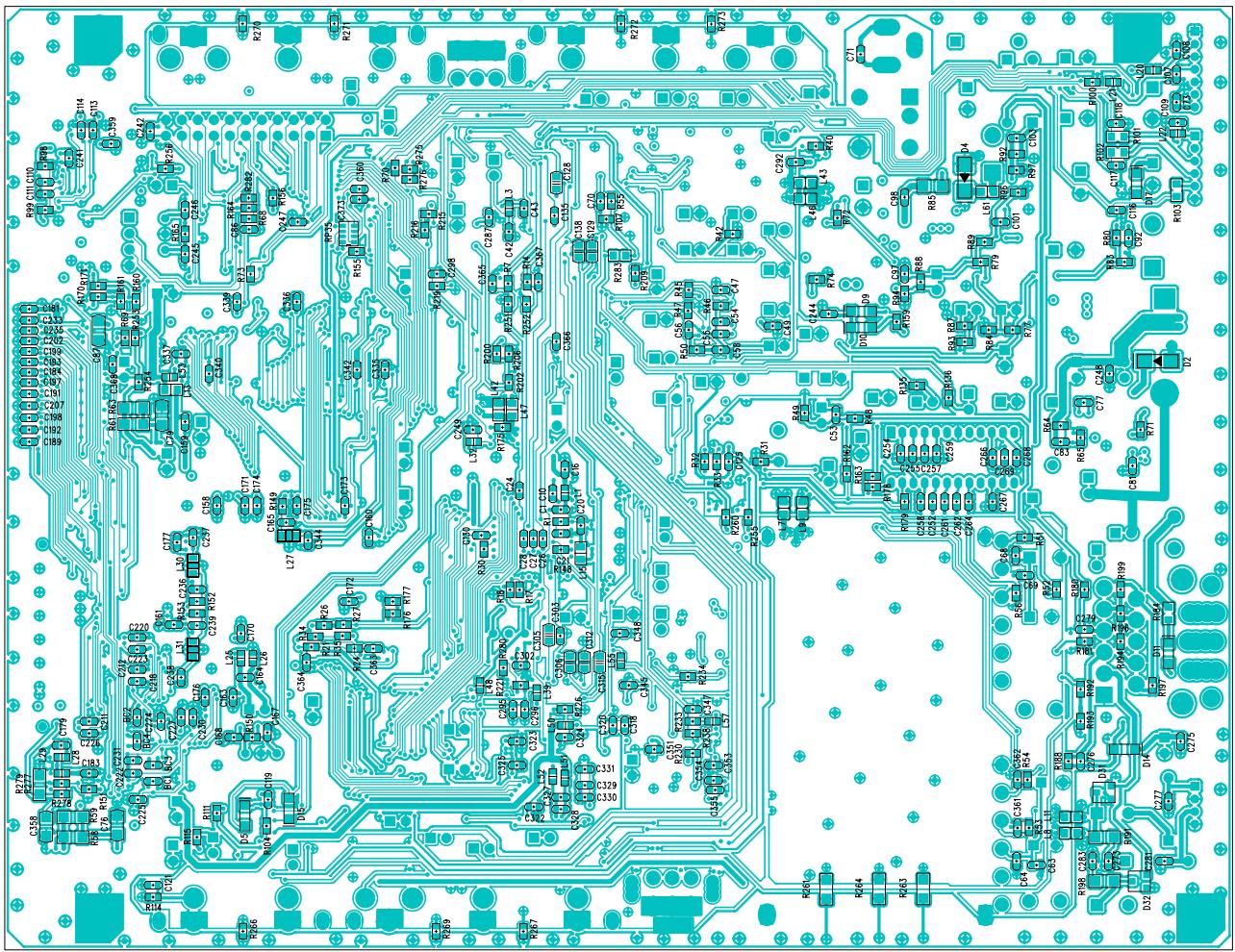
L4=SOLDER SIDE
(TEXT)

0171-5

ALL CLK NEED GND ADD BC1-BC4=VCC3
NET I2C <-> ANALOG (AUDIO)

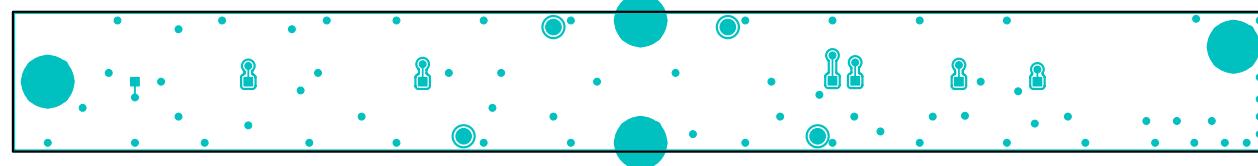
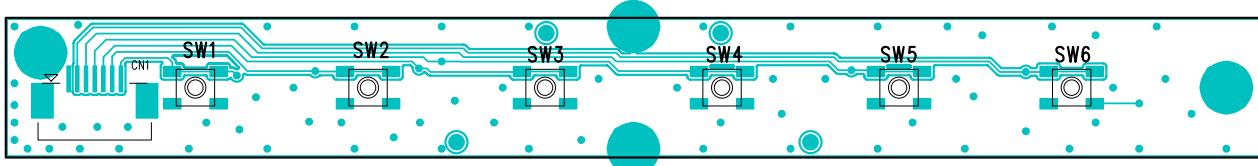
MOIRE = NPTH



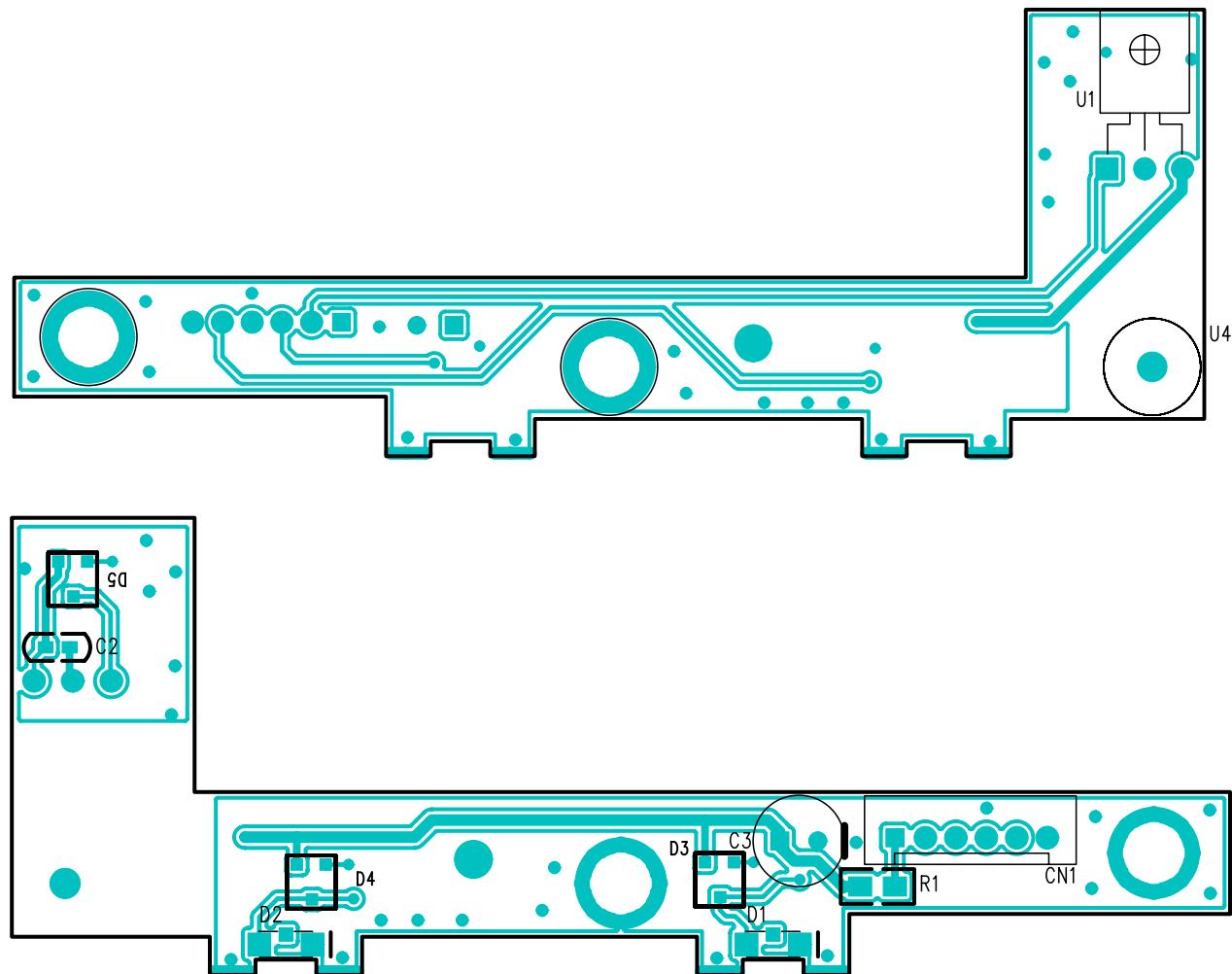


L4=SOLDER SIDE
(TEXT)

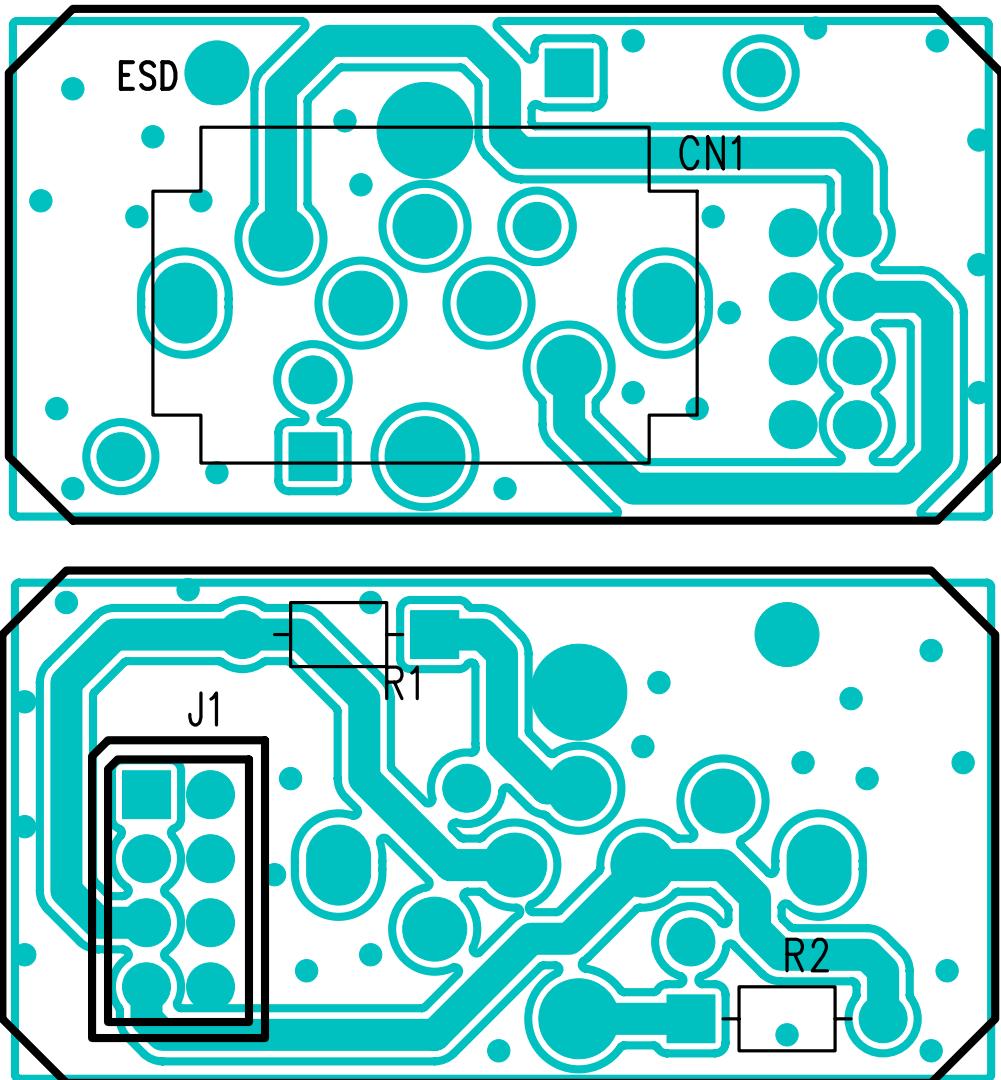
KEY/CONTROL BOARD



LIGHT-RECEIVING BOARD



EARPHONE BOARD



SCHEMATIC DIAGRAMS

 WARNING	BEFORE SERVICING THIS CHASSIS, READ THE WARNINGS AND CAUTIONS IN THE PREFACE.
 CAUTION	The international hazard symbols \blacktriangle in the schematic diagram and the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list. The mounting position of replacements is to be identical with originals. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE. Do not degrade the safety of the receiver through improper servicing.

NOTES:

1. RESISTOR

Resistance is shown in ohm [K = 1.000, M = 1.000.000]. All resistors are 1/6W and 5% tolerance carbon resistor, unless otherwise noted as the following marks.

1/2R = Metal or Metal oxide of 1/2 watt

1RF = Fuse resistor of 1 watt

1/2S = Carbon composition of 1/2 watt

10W = Cement of 10 watt

K = $\pm 10\%$

G = $\pm 2\%$

F = $\pm 1\%$

2. CAPACITOR

Unless otherwise noted in schematic, all capacitor values less than 1 are expressed in μF , and the values more than 1 in pF.

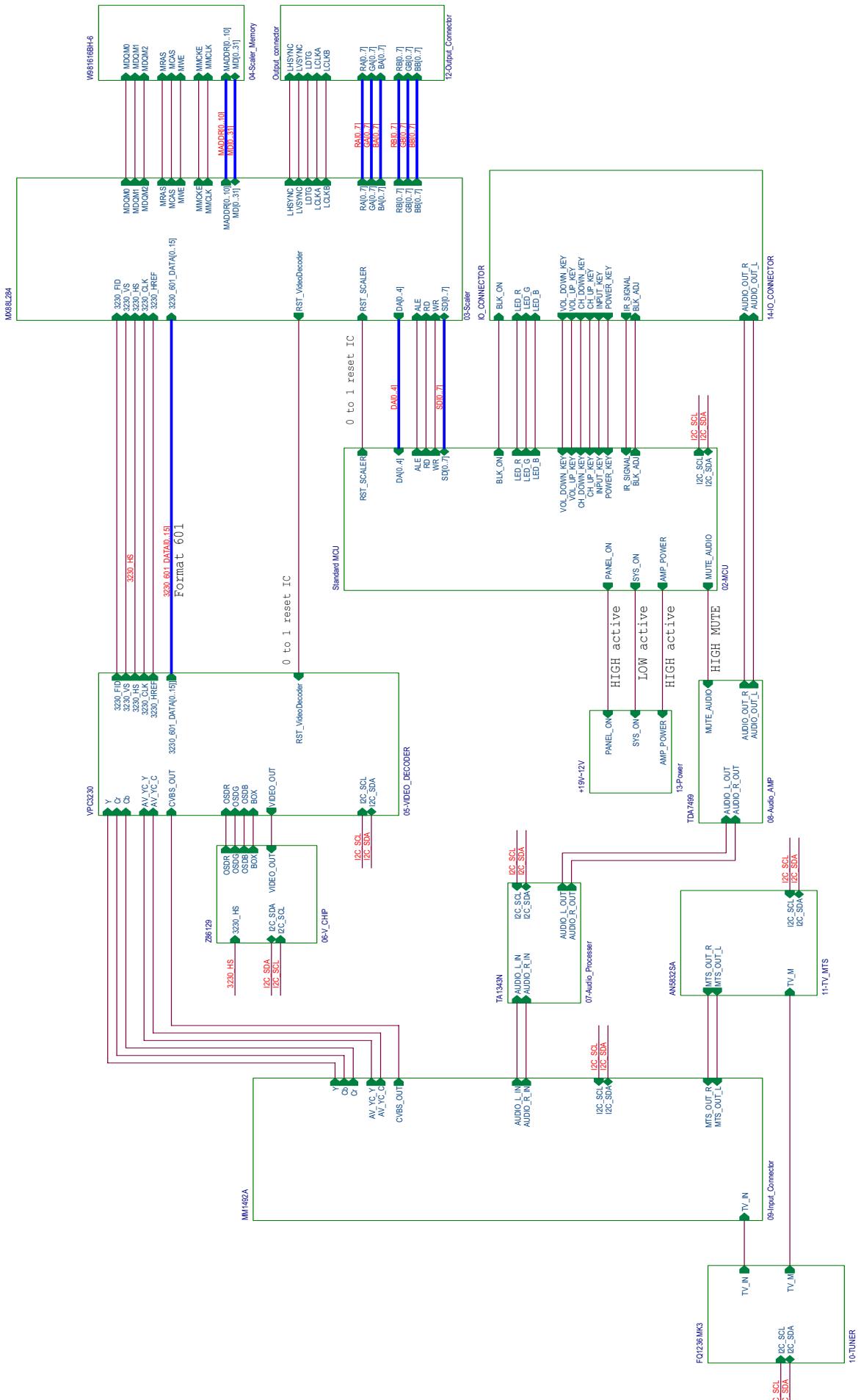
All capacitors are ceramic 50V, unless otherwise noted as the following marks.

Electrolytic capacitor 

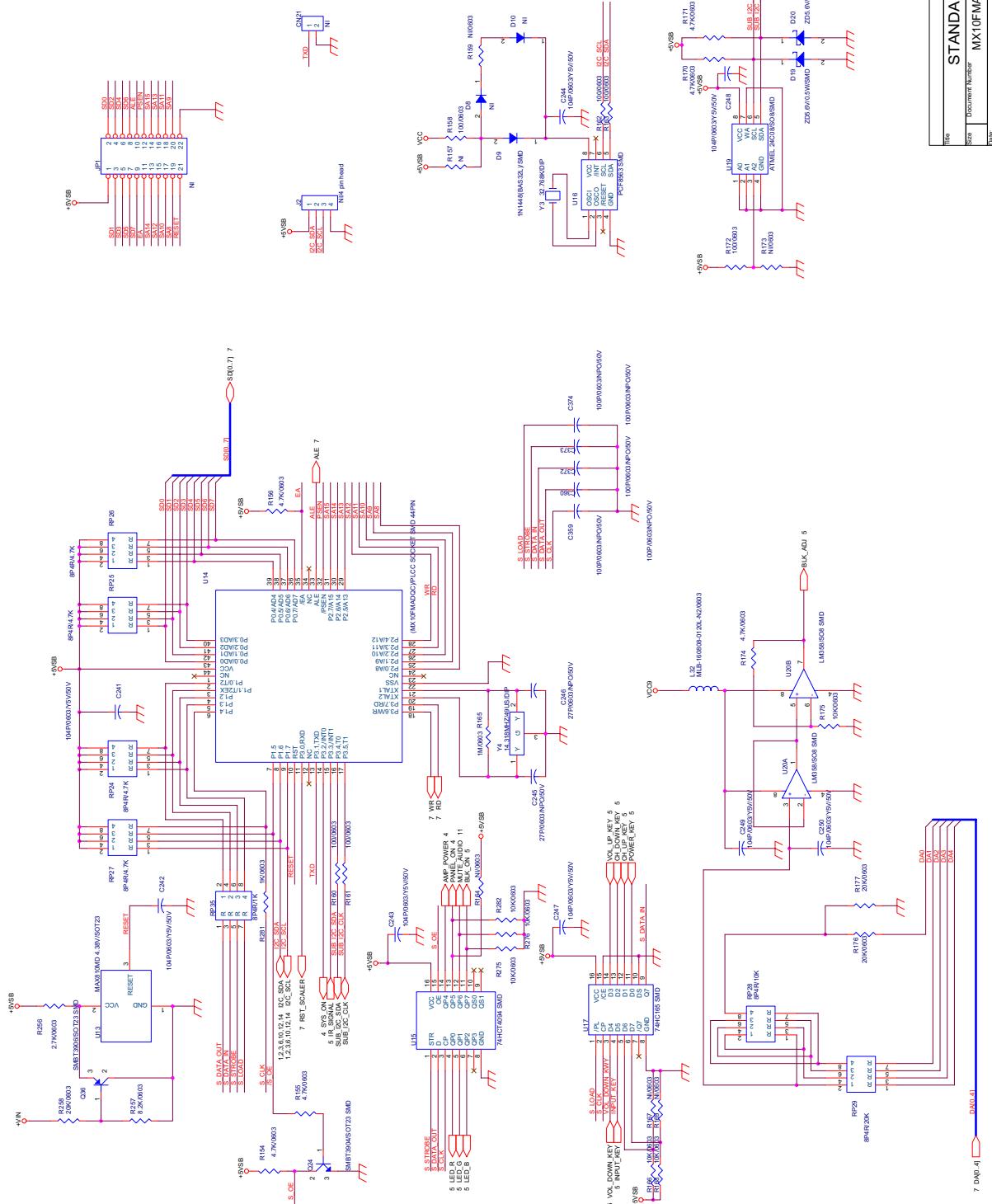
Mylar capacitor 

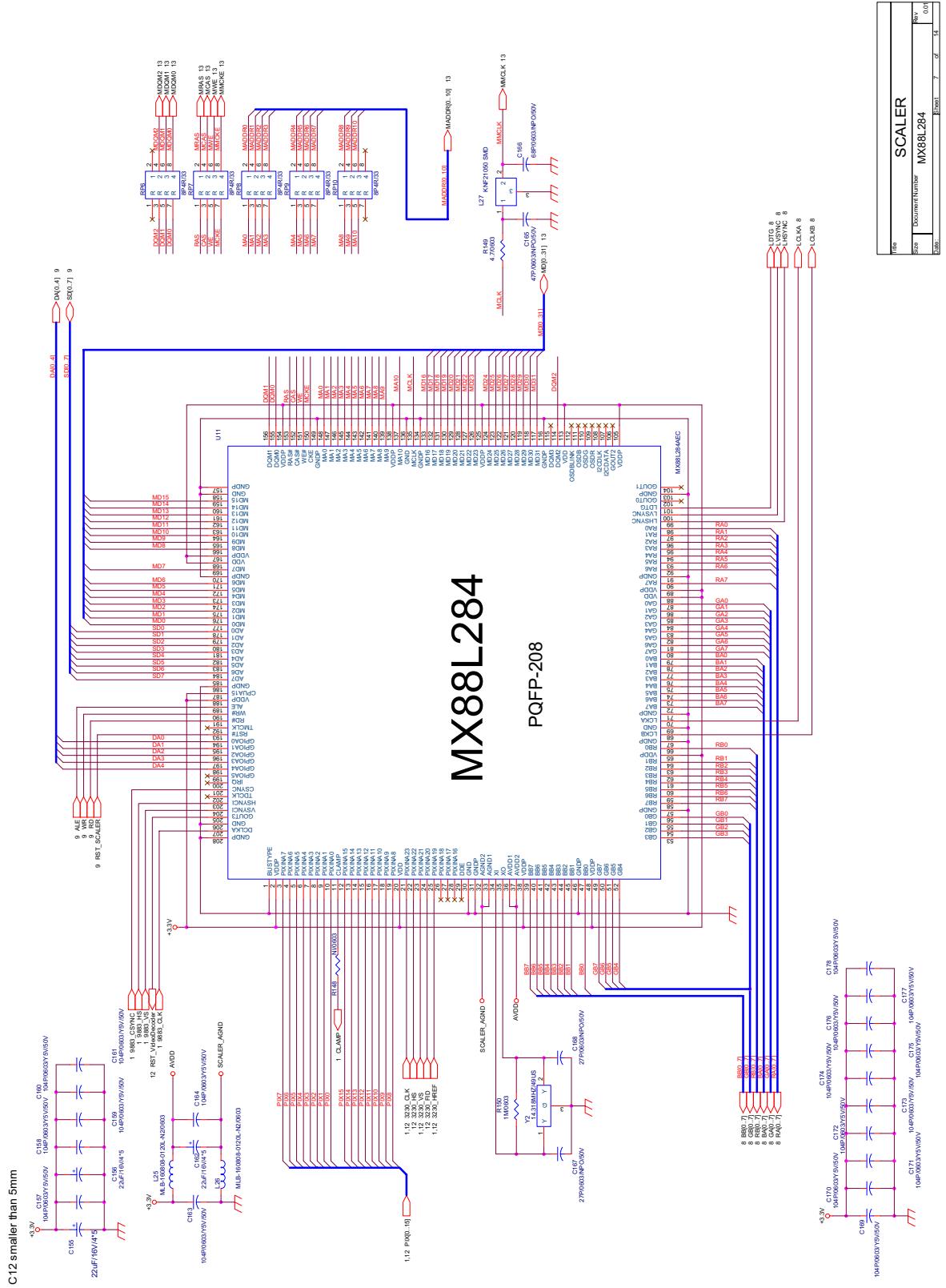
3. The parts indicated with \blacktriangle have special characteristics, and should be replaced with identical parts only.
4. Voltages read with DIGITAL MULTI-METER from point indicated to chassis ground, using a color bar signal with all controls at normal, line voltage 120 volts.
5. Waveforms are taken receiving color bar signal with enough sensitivity.
6. Voltage reading shown are nominal values and may vary $\pm 20\%$ except H.V.

BLOCK DIAGRAM

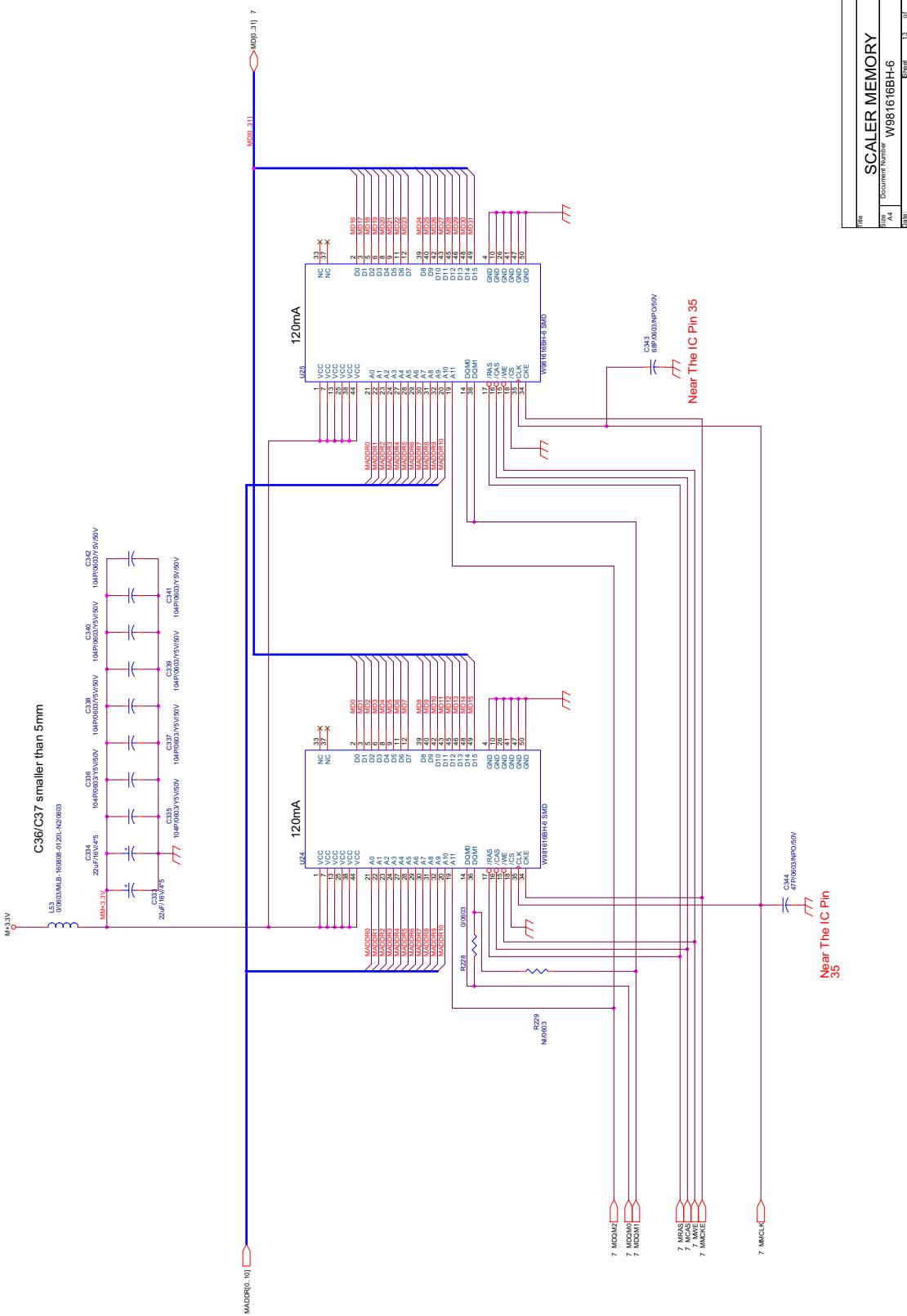


STANDARD MCU

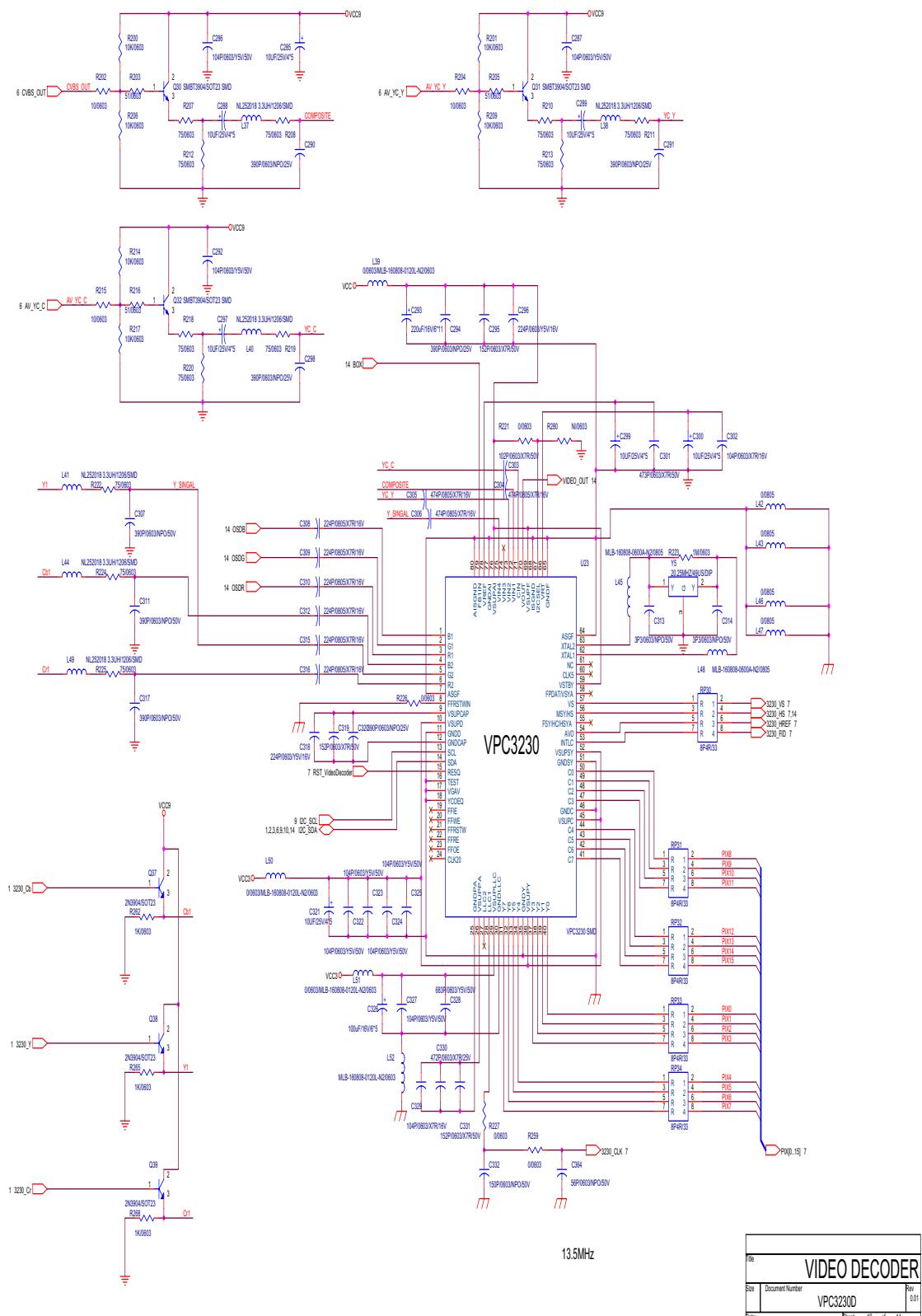




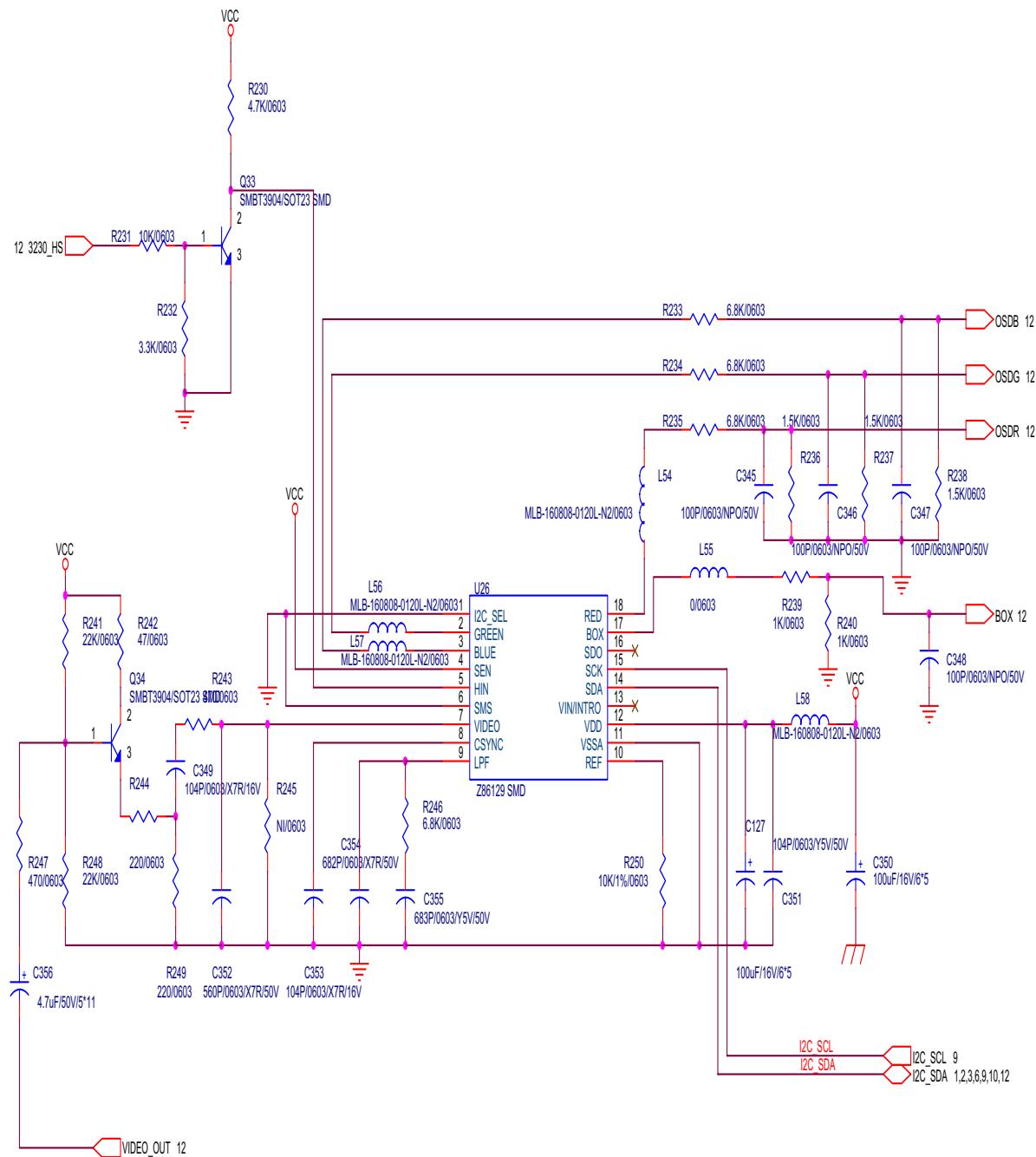
SCALER MEMORY



VIDEO DECODER

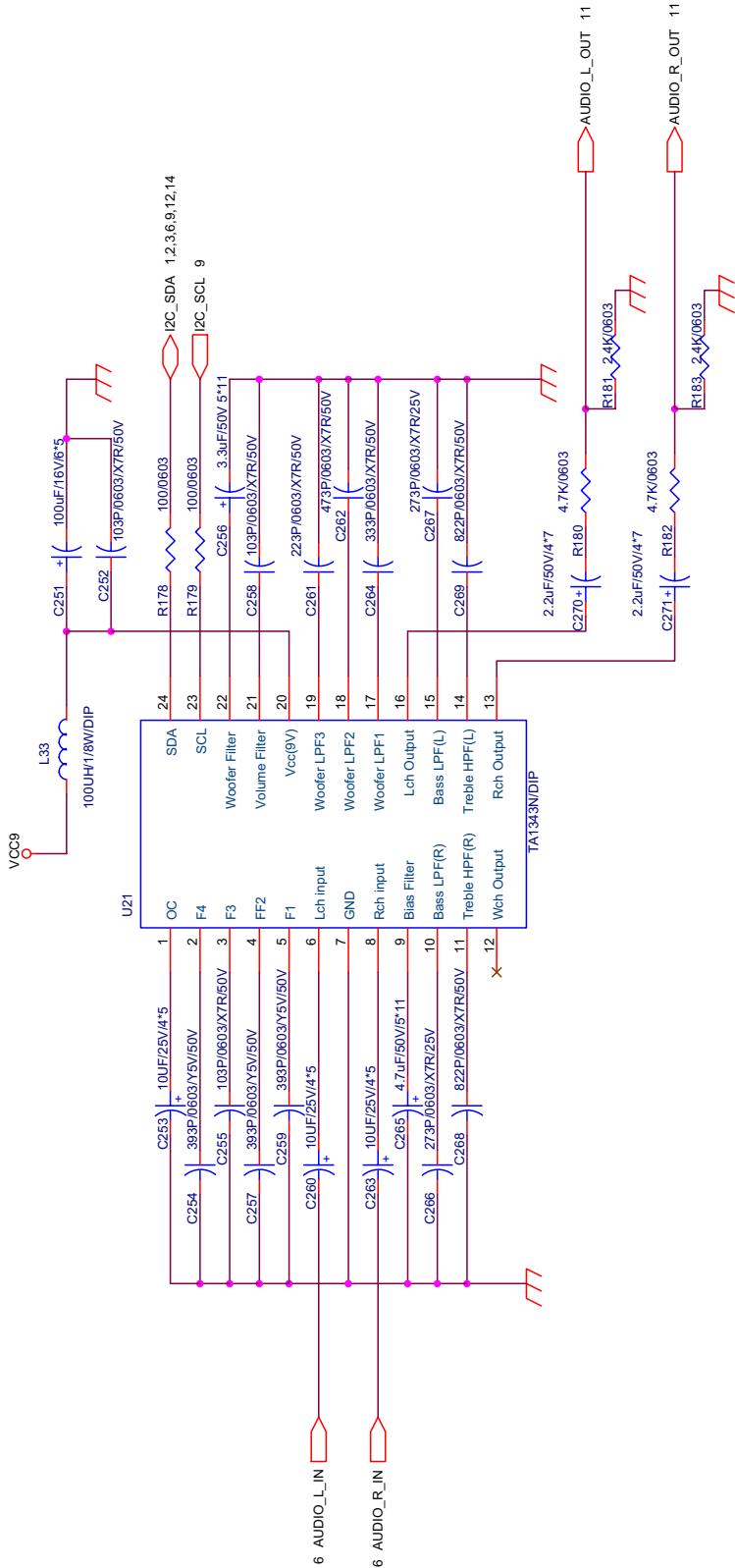


V-CHIP & CC



Title		
V-CHIP & CC		
Size	Document Number	Rev
A4	Z86129	0.01
Date:	Sheet 14	of 14

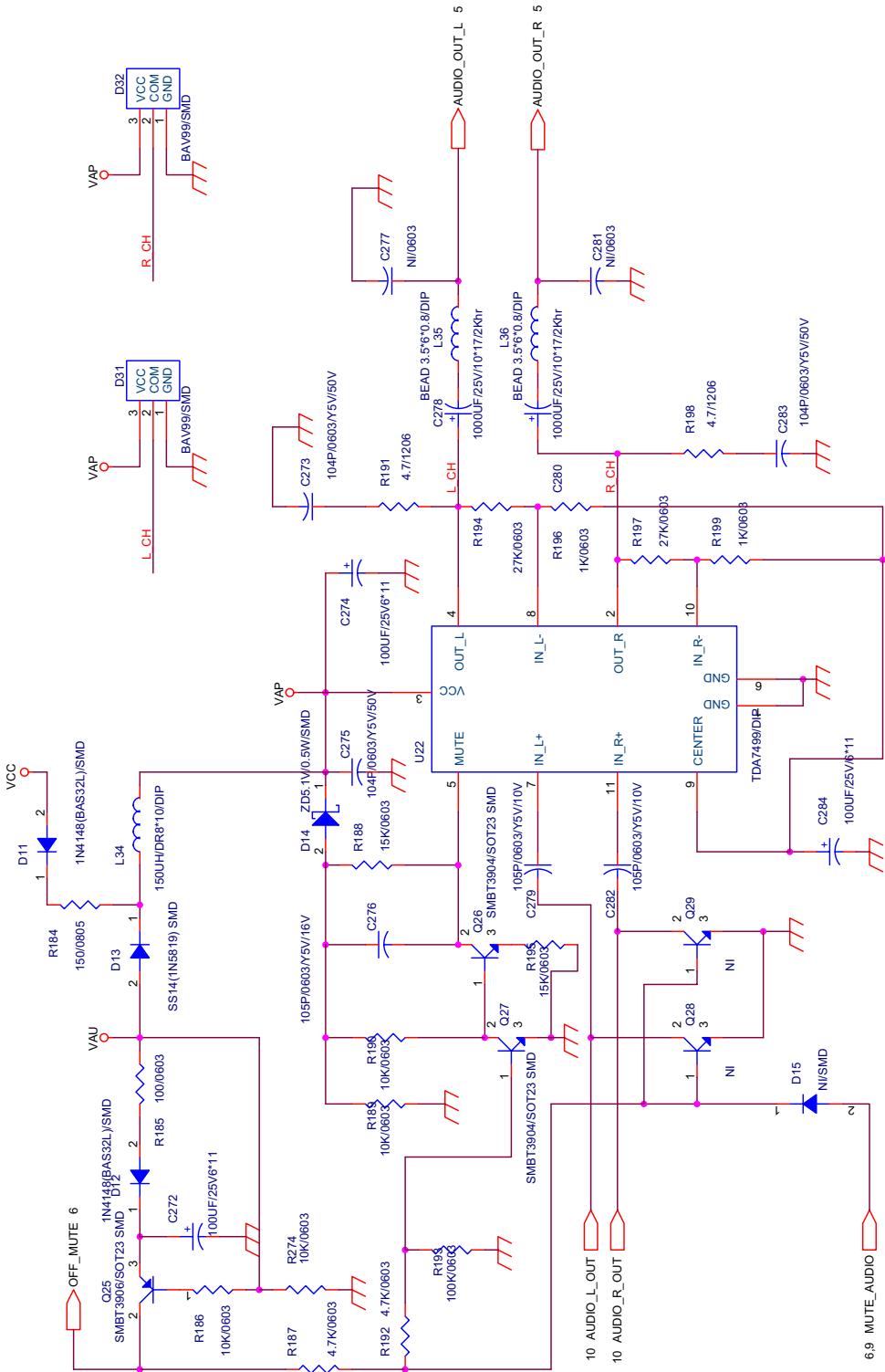
AUDIO PROCESSOR



GND GROUND

AUDIO PROCESSER			
Title	Document Number	Rev	
A4	TA1343N	0.01	
Date:	Sheet 10 of 14		

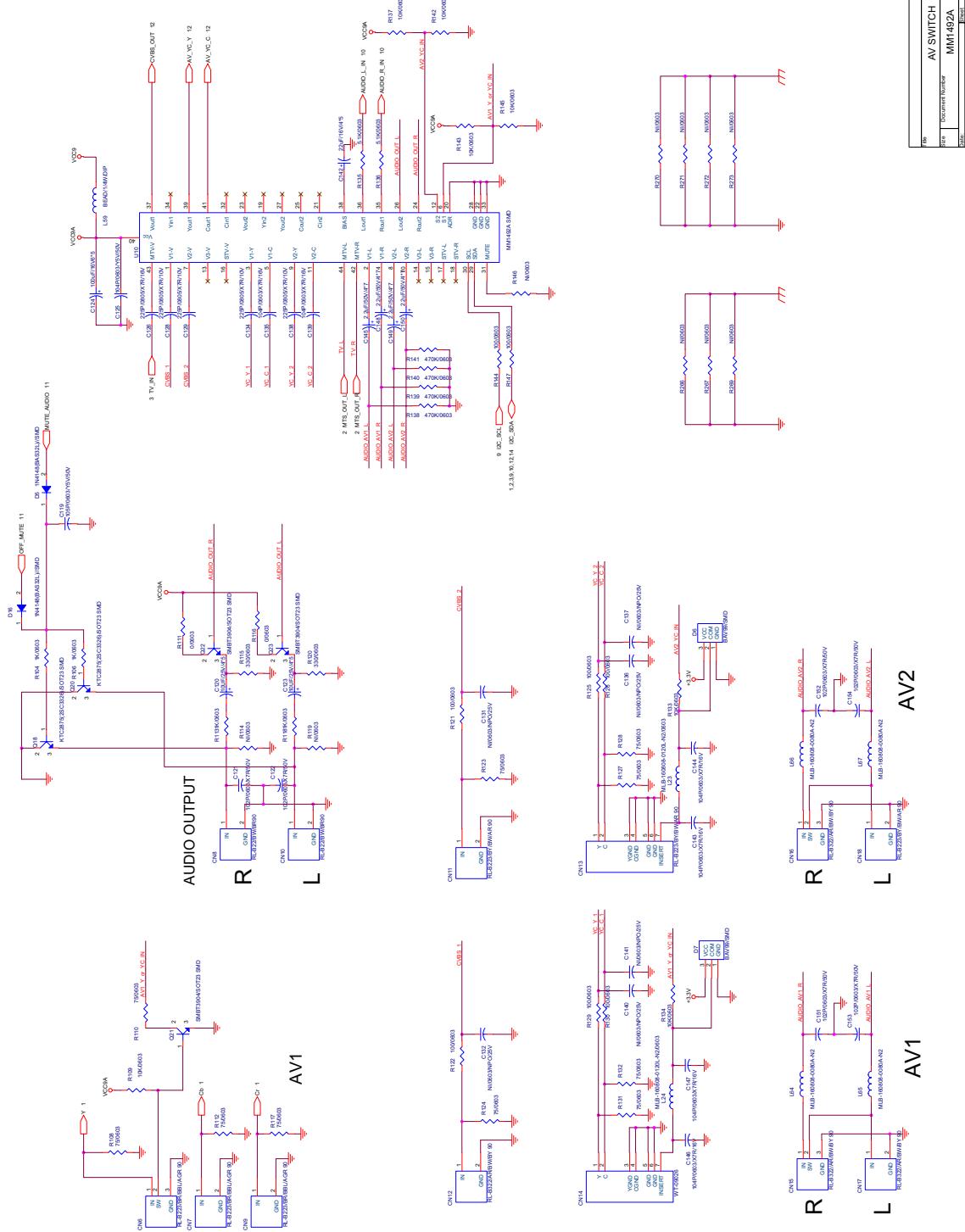
POWER AMPLIFIER



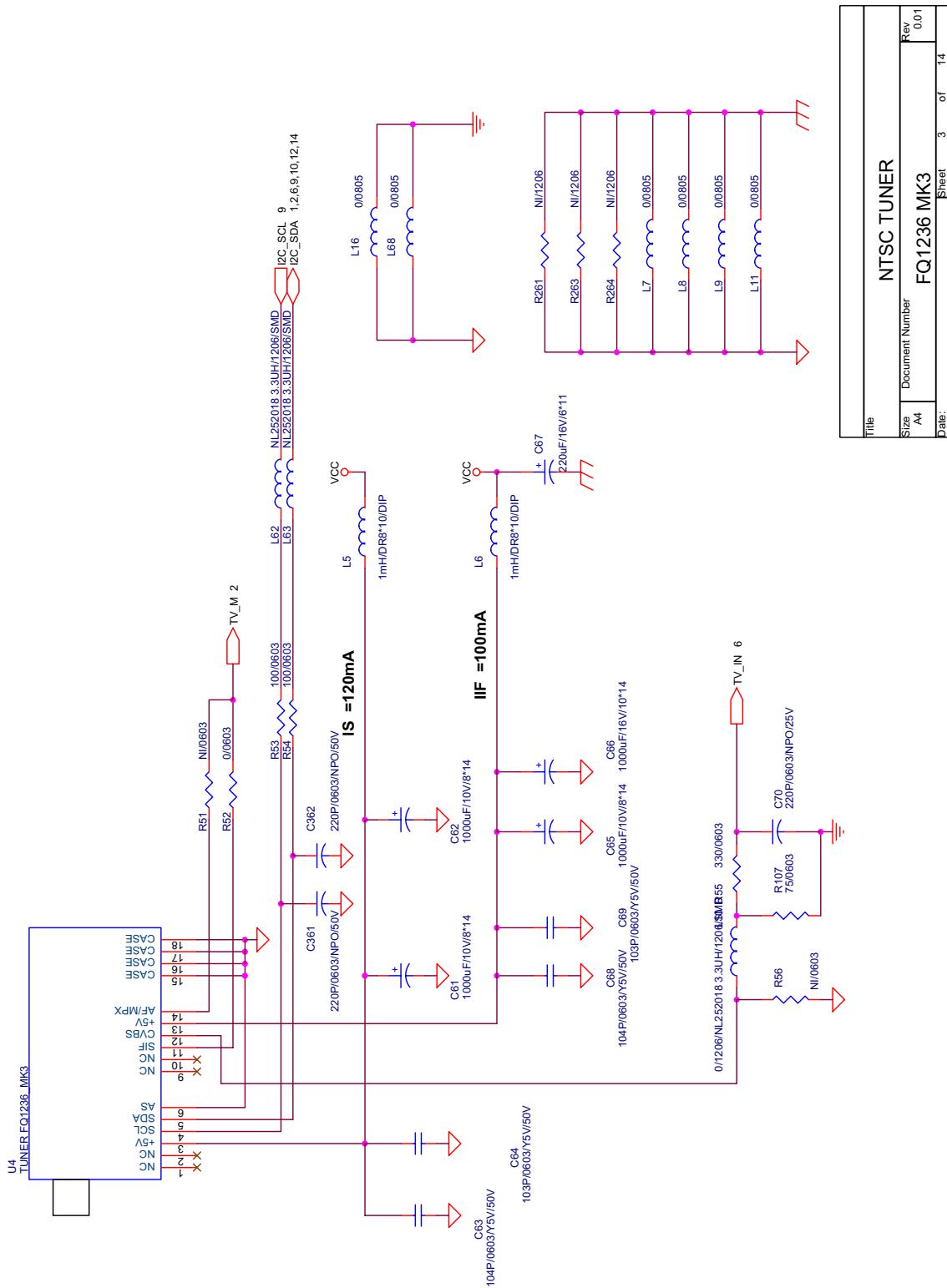
Title		POWER AMPLIFIER	
Size	Document Number	Rev	Date
A4	TDA7499 2X6W	Sheet 11 of 14	0.01

GND GROUND

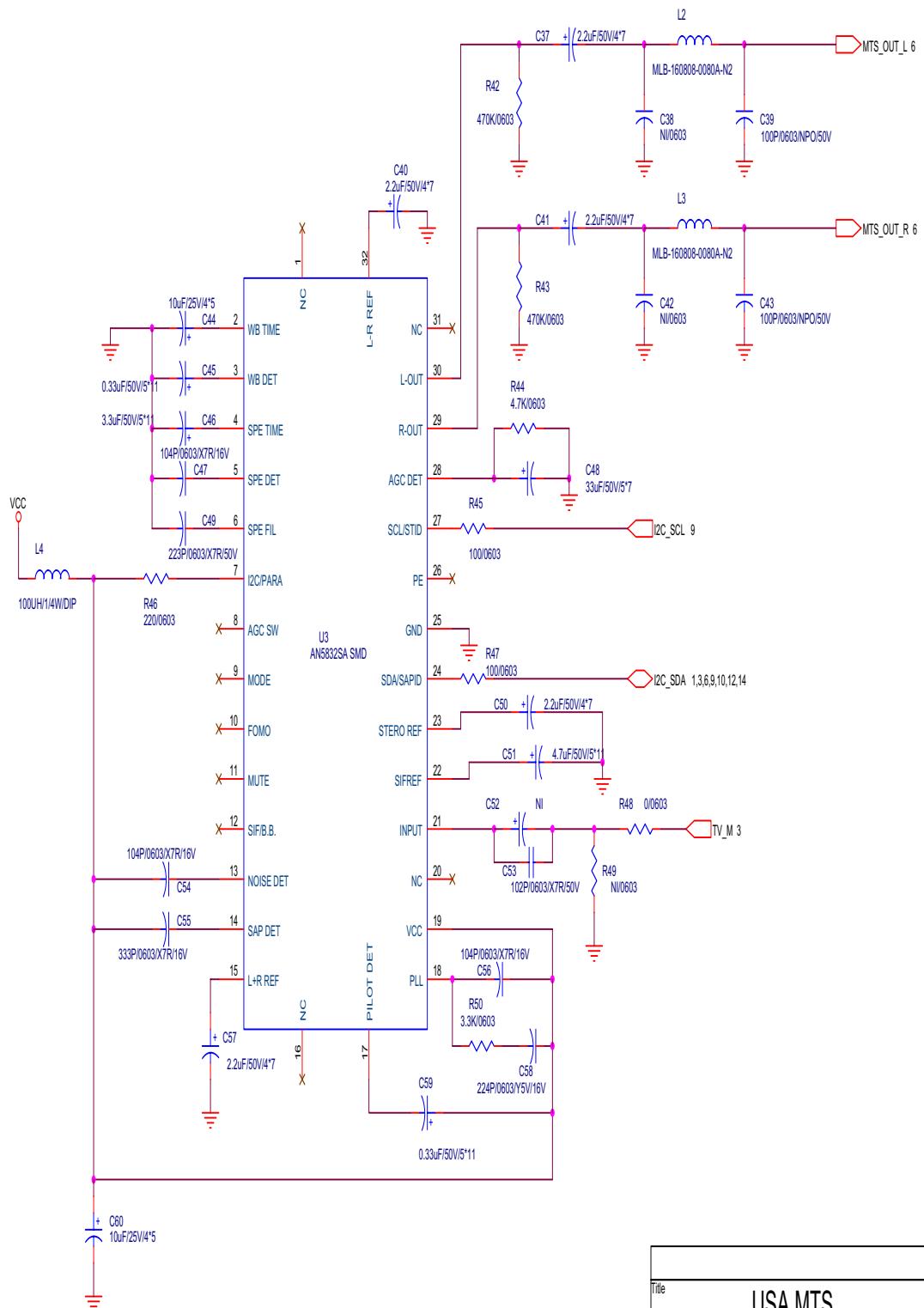
AV SWITCH



NTSC TUNER

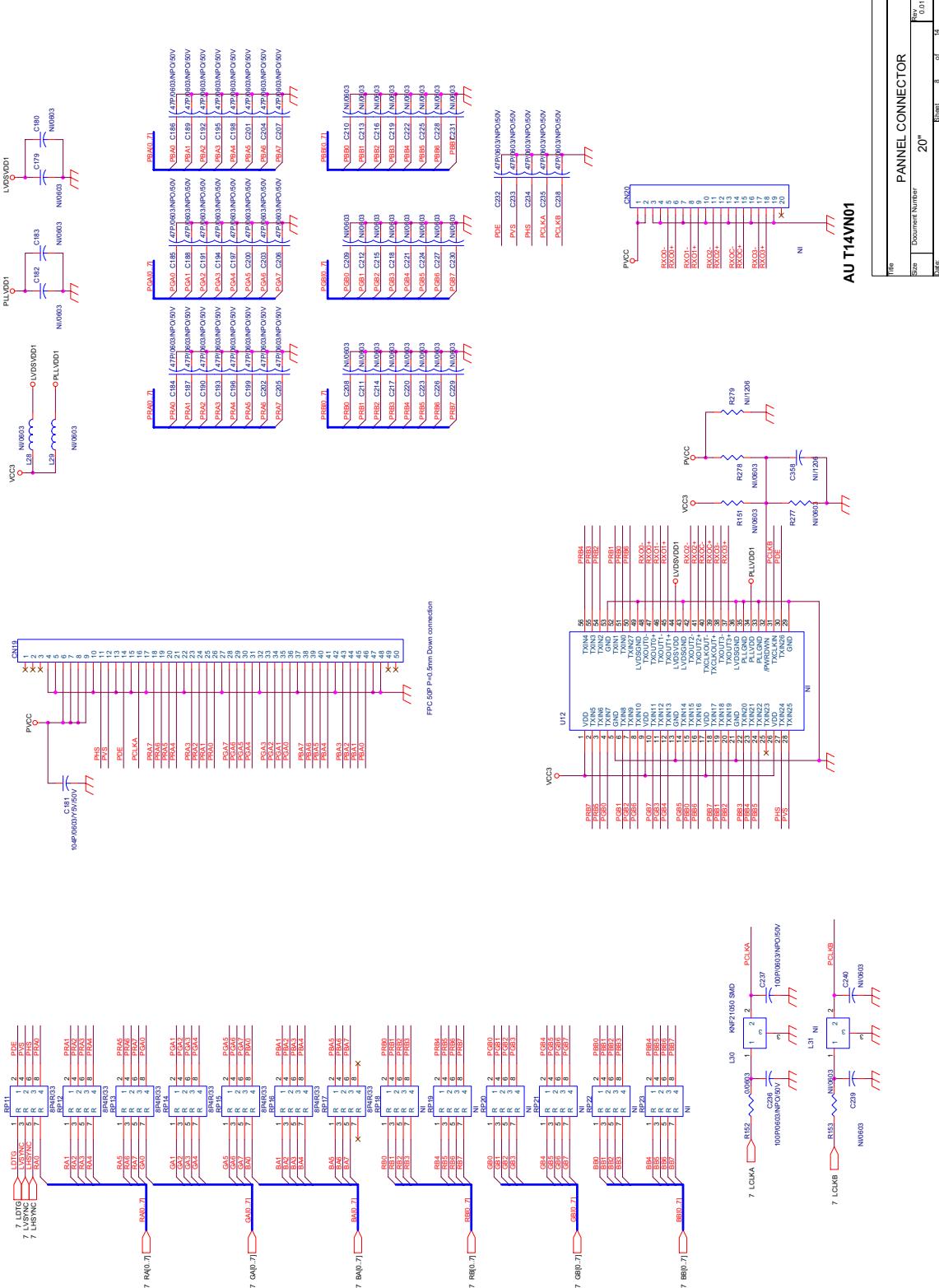


USA MTS

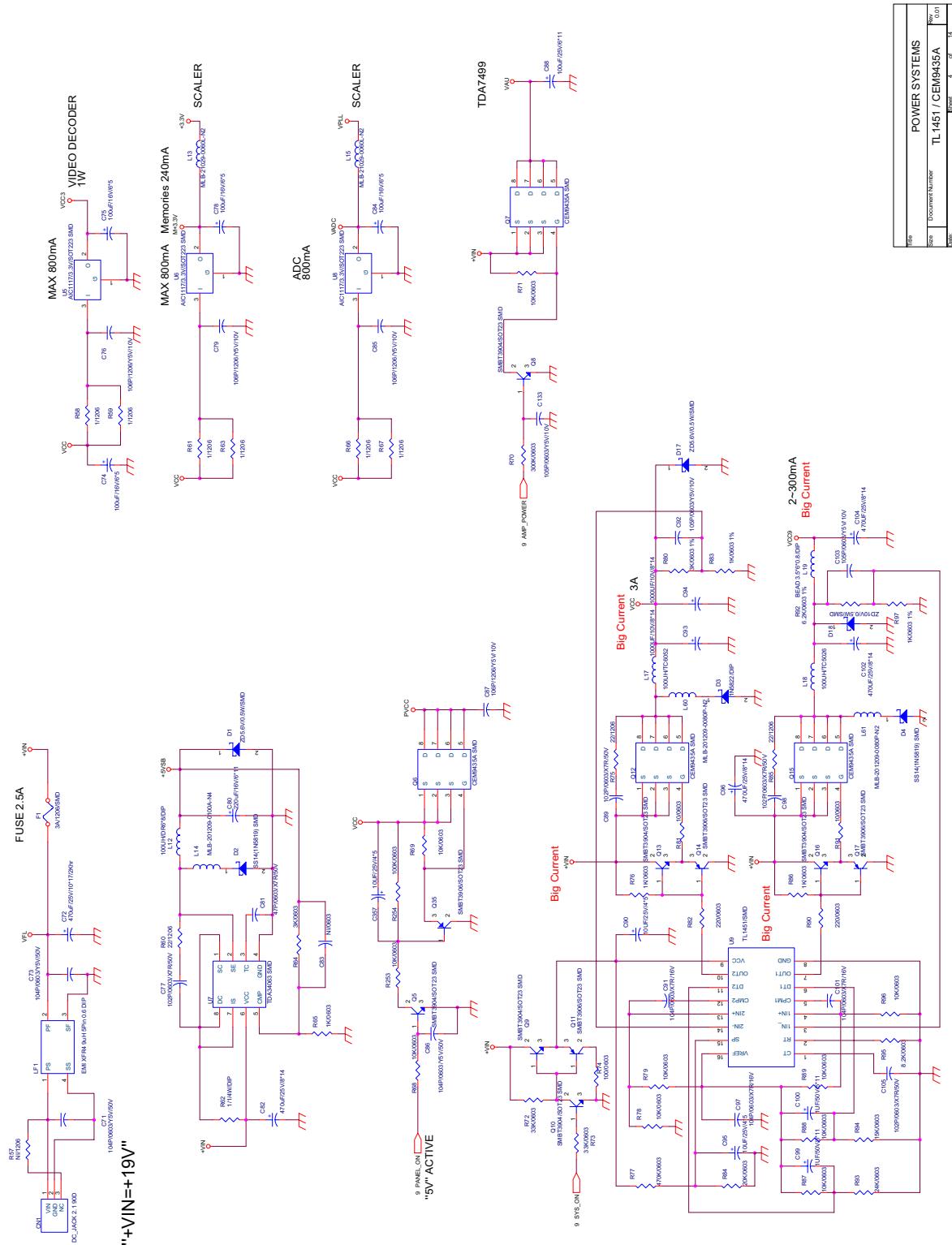


Title		
USA MTS		
Size Custom	Document Number AN5832SA	Rev 0.01
Date: 	Sheet 2 of 14	

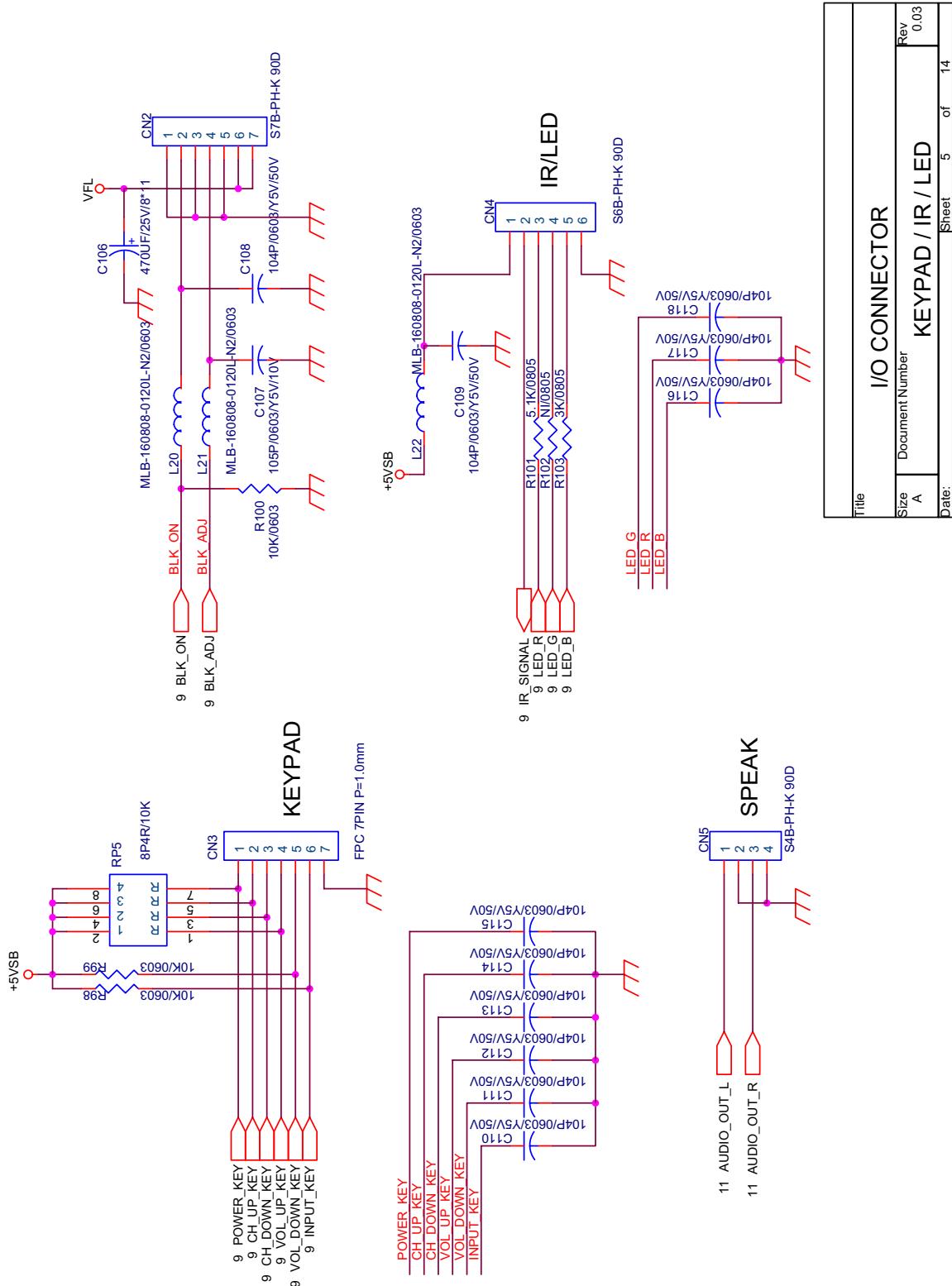
PANEL CONNECTOR



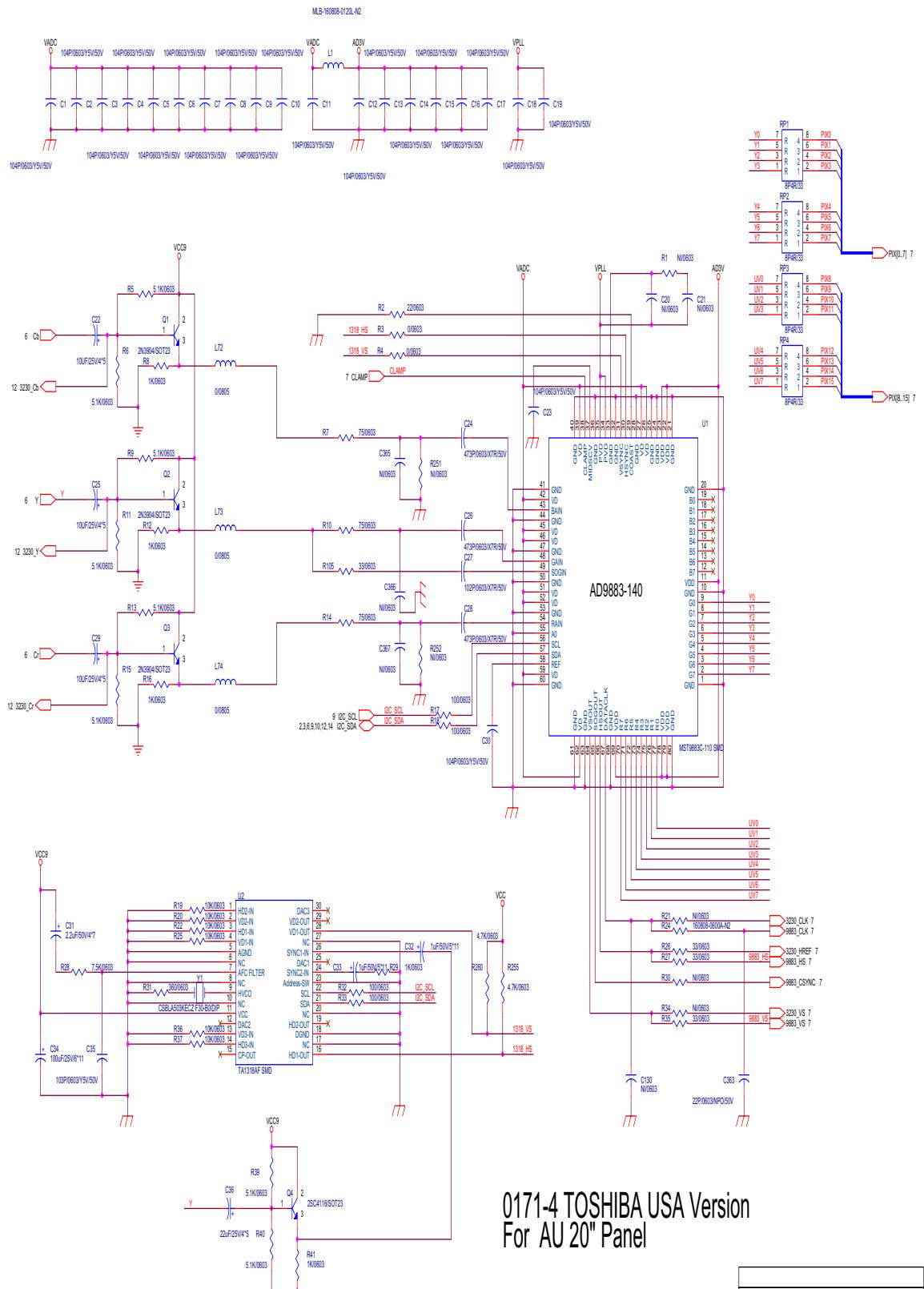
POWER SYSTEMS



I/O CONNECTOR



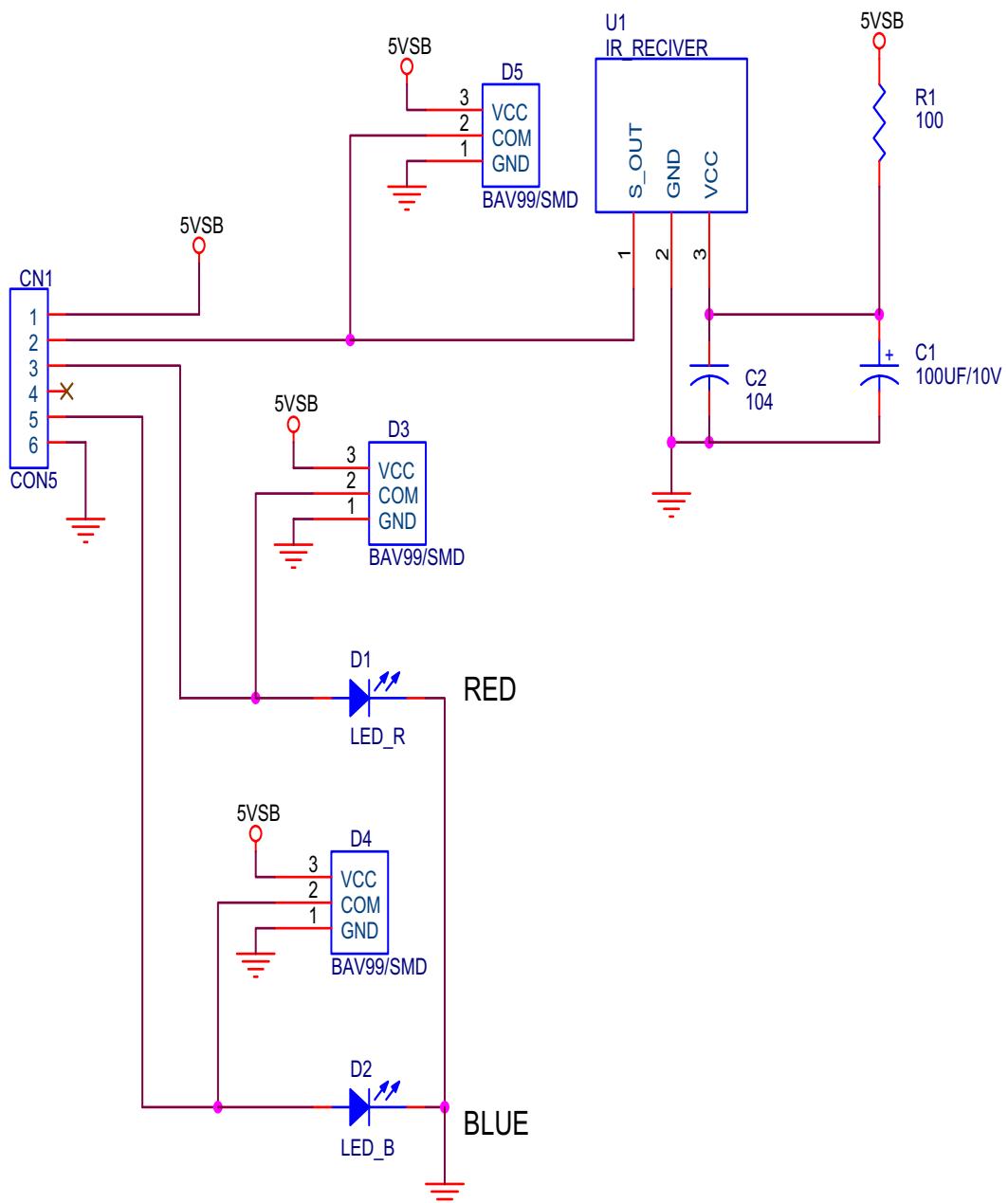
USA 480P



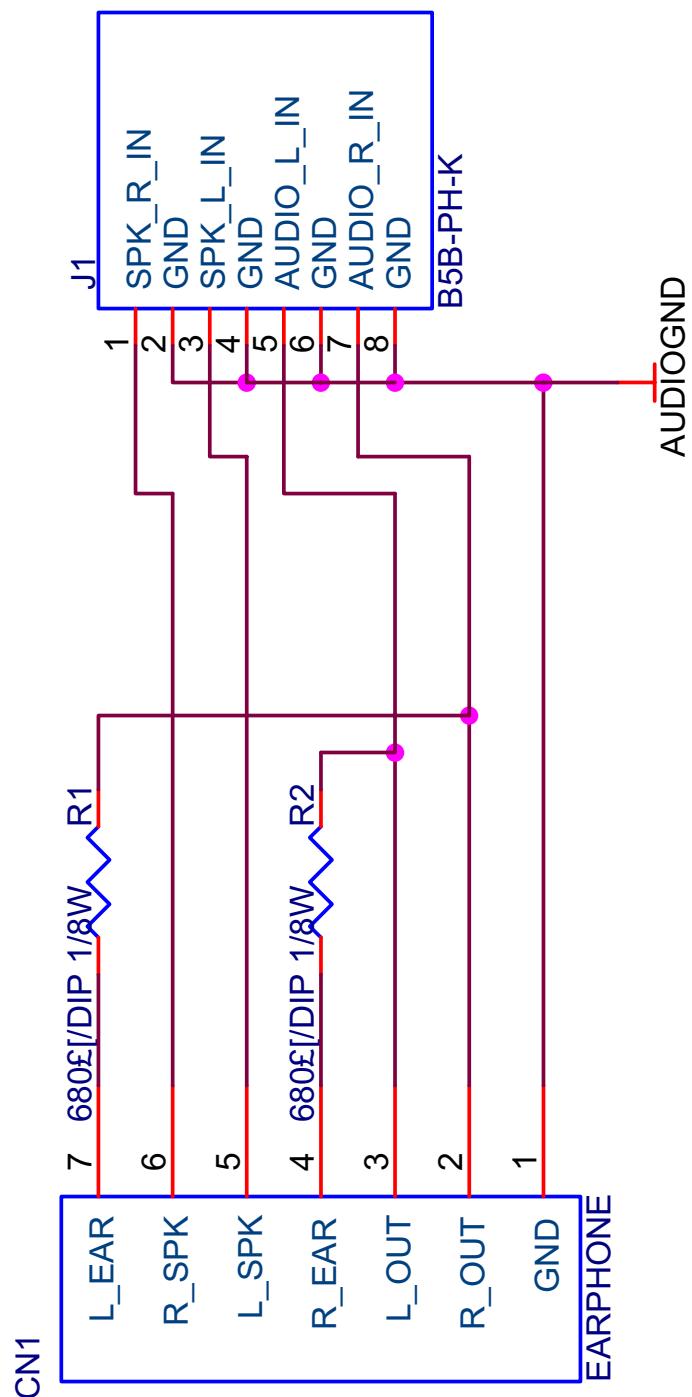
0171-4 TOSHIBA USA Version
For AU 20" Panel

Title	
USA 480P	
Size	Document Number
MST9883	Rev 0

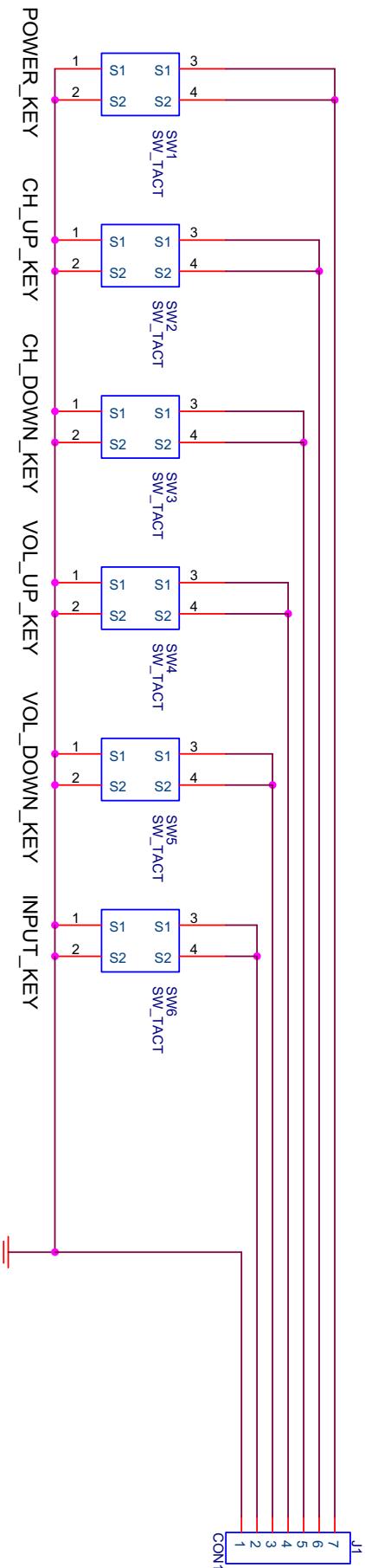
IR BOARD



EARPHONE BOARD



KEYPAD BOARD



CHASSIS AND CABINET REPLACEMENT PARTS LIST

WARNING: BEFORE SERVICING THIS CHASSIS, READ THE WARNINGS AND PRECAUTIONS IN THE PREFACE.

CAUTION: The international hazard symbols  in the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list. The mounting position of replacements is to be identical with originals. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE. Do not degrade the safety of the receiver through improper servicing.

NOTICE: The part number must be used when ordering parts, in order to assist in processing, be sure to include the Model number and Description.

14DL74

Safety	Location No.	TOSHIBA SN	Parts No. (GOLANA)	Description	Specification
	U001	72001930	AFT0-1014001715-14	A/D BD Sub Ass'y	MAIN (A/D) BOARD
	U002	72001908	AFT0-2000001765-US	SW BD Sub Ass'y	SW BD
	U003	72001909	AFT0-6000001742-US	Earphone BD Sub Ass'y	Earphone BD
	U004	72001910	AFT0-G014001758-US	IR DB Sub Ass'y	IR Board (GT140A)
	U902	72001892	EFZT-44140AU000	INVERTER	SUMIDA IV50140T/C3
	A101	72001931	AET0-1402000003	Front Cabinet Ass'y	F/P 14DL74
	A102	72001932	MP11-0008V121T2	Back Cabinet-US	B/P 14DL74
	A103	72001895	MP11-0010V131Z0	Back Cover	B/C 14DL74
	A104	72001896	AET0-1401000001	Pedestal Ass'y	Stand 14DL74
	A105	72001863	MP11-0004V102C0	Function Key	F/KEY 14DL74
	A106	72001933	MP11-0011V121T0	I/O Cover (US)-R	S/C (R) 14DL74
	A107	72001934	MP11-0012V121T0	I/O Cover (US)-L	S/C (L) 14DL74
	A108	72001866	MP11-0007V131Z0	Handle-125*37.5mm	H/C 14DL74
	A701	72001935	PB20-T140140031	Inside Carton-14DL74	Carton 14DL74
	A702	72001936	PF21-T140000011	EPE Foam-L	Dumper (L) 14DL74
	A703	72001937	PF22-T140000011	EPE Foam-R	Dumper (R) 14DL74
	B201	72001900	MM05-0040V100D0	Panel Bracket	P/Bracket 14DL74
	B202	72001871	MM05-0041V100D0	A/D BD Shield	AD/Bracket 14DL74
	B203	72001872	MM43-0005V100Z0	EMI Shield	EMI/S 14DL74
	B204	72001938	MM05-0043V100D0	I/O Bracket	S/B (R) 14DL74
	B205	72001939	MM05-0042V100D0	I/O Bracket	S/B (L) 14DL74
	B206	72001901	MI21-0000000014	Insulator 14" Inverter 150*54mm	Insulator 14DL74
	B207	72001940	MP53-0002V133Z2	LED Lens Trim	Lens Trim 14DL74
	B208	72001877	MSUA-3006PSN200	Screw	S3x6
	B209	72001878	MSUA-3008PSN200	Screw	S3x8
	B210	72001879	MSUA-3010PSN200	Screw	S3x10
	B211	72001880	MSBC-3004PSN100	Screw	M3x4
	B212	72001881	MSBA-3005PSN100	Screw	M3x5
	B214	72001882	MSBO-4006PSN100	Screw	M4x6
	B215	72001903	MM21-0002V100D0	Hinge	Hinge 14DL74 GT140/201A English 210x297mm
	Y101	72001924	PP20-T000EN1421	User's Manual-(DL74)CN14	
	Y150	72001925	EFB1-5534200000	AC To DC Adapter (black)	TAA-Y58 19V/3.42A 65W

Safety	Location No.	TOSHIBA SN	Parts No. (GOLANA)	Description	Specification
!	Y151	72001926	EW12-HUS2000000	AC Power Cord	SP-12A+IS-038A L=2M
!	K901	72001927	EFA1-8640014000	Remote Control-English	CT-864-CN14
!	E901	72001905	EPBT-140TAU0000	Panel TFT	AU 14" T140VN01
	W601	72001906	EF61-3400500604	Square Speaker 14"(B)	34*34 6Ω [/5W(MAX) L=28/21cm]

20DL74

Safety	Location No.	TOSHIBA SN	Parts No. (GOLANA)	Description	Specification
!	U001	72001907	AFT0-1020001714-20	A/D BD Sub Ass'y-20"	MAIN(A/D) BOARD
!	U002	72001908	AFT0-2000001765-US	SW BD Sub Ass'y	SW BD
!	U003	72001909	AFT0-6000001742-US	Earphone BD Sub Ass'y	Earphone BD
!	U004	72001910	AFT0-G020101758-US	IR DB Sub Ass'y	IR Board(GT201A)
!	U902	72001911	EFZT-46200AU000	INVERTER	SUMIDA IV65180/T
!	A101	72001912	AET0-2012000003	Front Cabinet Ass'y	F/P 20DL74
!	A102	72001913	MP11-0014V121T2	Back Cabinet-US	B/P 20DL74
!	A103	72001861	MP11-0016V131Z0	Back Cover	B/C 20DL74
!	A104	72001862	AET0-2011000001	Pedestal Ass'y	Stand 20DL74
!	A105	72001863	MP11-0004V102C0	Function Key	F/KEY 20DL74
!	A106	72001914	MP11-0011V121T0	I/O Cover (US)-R	S/C (R) 20DL74
!	A107	72001915	MP11-0012V121T0	I/O Cover (US)-L	S/C (L) 20DL74
!	A108	72001866	MP11-0007V131Z0	Handle-125x37.5mm	H/C 14LS20
!	A701	72001916	PB20-T201140031	Inside Carton-20DL74	Carton 20DL74
!	A702	72001917	PF21-T201000011	EPE Foam-L	Dumper (L) 20DL74
!	A703	72001918	PF22-T201000011	EPE Foam-R	Dumper (R) 20DL74
!	B201	72001919	MM05-0047V100D0	Panel Bracket	P/Bracket 20DL74
!	B202	72001871	MM05-0041V100D0	A/D BD Shield	AD/Bracket 20DL74
!	B203	72001872	MM43-0005V100Z0	EMI Shield	EMI/S 20DL74
!	B204	72001920	MM05-0043V100D0	I/O Bracket	S/B (R) 20DL74
!	B205	72001921	MM05-0042V100D0	I/O Bracket	S/B (L) 20DL74
!	B206	72001922	MI21-0000000015	Insulator 20" Inverter 182x67mm	Insulator 20DL74
!	B207	72001923	MP53-0003V133Z2	LED Lens Trim	Lens Trim 20DL74
!	B208	72001877	MSUA-3006PSN200	Screw	S3x6
!	B209	72001878	MSUA-3008PSN200	Screw	S3x8
!	B210	72001879	MSUA-3010PSN200	Screw	S3x10
!	B211	72001880	MSBA-3004PSN100	Screw	M3x4
!	B212	72001881	MSBA-3005PSN100	Screw	M3x5
!	B214	72001882	MSBO-4006PSN100	Screw	M4x6
!	B215	72001883	MM21-0003V100D0	Hinge	Hinge 14DL74
!	Y101	72001924	PP20-T000EN1421	User's Manual-(DL74)CN14	GT140/201A English 210x297mm
!	Y150	72001925	EFB1-5534200000	AC To DC Adapter (black)	TAA-Y58 19V/3.42A 65W
!	Y151	72001926	EW12-HUS2000000	AC Power Cord	SP-12A+IS-038A L=2M
!	K901	72001927	EFA1-8640014000	Remote Control-English	CT-864-CN14
!	E901	72001928	EPBT-201TAU0005	Panel TFT	AU 20.1" AU201SN01.V6
!	W601	72001929	EF61-3400500601	Square Speaker 20"(B)	34*34 6Ω [/5W(MAX) L=40/25cm]

SPECIFICATIONS

14/20DL74 LCD TV Specifications

Television System	NTSC standard
Power Source	120V AC, 60 Hz DC 19V/3.4A (TV input)
Power Consumption	14DL74: 42W (average) 20DL74: 48W (average)
Display	TFT Active Matrix LCD 14DL74: VGA 640 (H) dots x 480 (V) dots 20DL74: VGA 800 (H) dots x 600 (V) dots
Audio Power	2.5W + 2.5W
Speaker Type	3.4 x 3.4 cm
Video/Audio Terminals	S-VIDEO INPUT Y: 1 V (p-p), 75 ohm, negative sync. C: 0.286 V (p-p) (burst signal), 75 ohm VIDEO/AUDIO INPUT (1, 2) VIDEO: 1 V (p-p), 75 ohm, negative sync. AUDIO: 150 mV (rms) (30% modulation equivalent, 47k ohm) ColorStream™ (component video) INPUT Y: 1V (p-p), 75 ohm PR: 0.7V (p-p), 75 ohm PB: 0.7V (p-p), 75 ohm AUDIO: 150 mV (rms), 47k ohm AUDIO OUTPUT AUDIO: 150 mV (rms) (30% modulation equivalent, 4.7k ohm) HEADPHONES JACK 3.5 mm mini-stereo (Impedance 8~32 ohm)
Dimensions	14DL74: Width 13.86 inches (352 mm) Height 14.88 inches (378 mm) Depth 7.09 inches (180 mm) 20DL74: Width 19.06 inches (484 mm) Height 19.72 inches (501 mm) Depth 10.04 inches (255 mm)
Weight	14DL74: 10.14 lbs (4.6 kg) 20DL74: 19.62 lbs (8.9 kg)
Supplied Accessories	Remote Control (CT-864) and two "AAA" batteries Power cord AC adapter (TAA-Y58) (The AC adapter can be only used for this LCD TV. Do not use for other apparatus.) Owner's Manual

Design and specifications are subject to change without notice.

LCD display panels are manufactured using an extremely high level of precision technology; however, sometimes some parts of the screen may be missing picture elements or have luminous spots. This is not a sign of a malfunction. You can enjoy a video game with this TV. However, some games which use ray guns or other devices that use the screen as a target may not work correctly.

TOSHIBA CORPORATION

1-1, SHIBAURA 1-CHOME, MINATO-KU, TOKYO 105-8001, JAPAN